

Containers: Project for a New Urbanism

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Master of Architecture
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Submitted to the Department of Architecture
in partial fulfillment of the requirements for the Degree of
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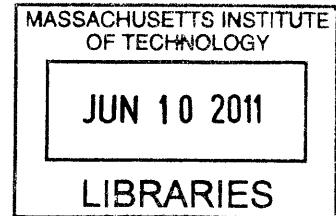
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ABSTRACT

This project investigates the possibilities of a new urbanism in vast territories of urban industrial and logistics landscapes, which have become a significant feature of the American city. It is a search for a hybrid typology of habitation and production for these neglected fields.

The project starts with a research on urban industrial landscapes of major american cities in order to extract common features, then focuses on Boston industrial area as an example of such condition. It explores patterns with the ability to expand and readapt to different scales and urban conditions. The project concludes with proposing a new typology, which maintains industries on the ground level, adjacent to transportation networks, and proposes a stem structure, which runs through these mega boxes, providing access, infrastructure and service spaces for industries while creating a base for a new linear city on top.

mergence of industries and habitation allows new forms of agriculture and energy production, using industrial waste water and waste heat, which this project has tried to address with design solutions.

keywords: Industrial Landscape, Logistics Landscape,
Infrastructure, Hybrid Typology

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CONTENT

Acknowledgments	7
Introduction	10
Chapter 1: Urban Industrial Landscape of America	13
Chapter 2: the Big Box	25
Chapter 3: the Project	35
Conclusion	65
Bibliography.....	67

“Ultimately, the most ambitious project is one that aspires to the design and planning of both realms, a practice in which both the emergent landscape of logistics and the traditional cultural landscapes that they support might be drawn together through shared spatial and material languages.”¹

This project investigates the possibilities of a new urbanism in vast territories of urban industrial and logistics landscapes, which have become a significant feature of the American city. Following emergent concerns for energy, infrastructure and sustained development, it is a search for a hybrid typology of habitation and production for these neglected fields.

The project investigates American urban industrial fields as a distinct urban typology. Although different in proportions to the city—larger in Chicago and Los Angeles, smaller in New York and Boston—they all share common features in terms of function, appearance, composition, location, and relation to the city. In almost all cases, they have ruptured the urban fabric, causing disconnection among neighborhoods. Most of these industrial lands are strategically located in areas between downtown and mid-dense residential developments, along networks of infrastructure and transportation. Stretched along railroads and main arteries, they benefit from this proximity to deliver their services to the city in the quickest and cheapest way. The dominant typology is Big Box, containing light industries, warehouses, and mega stores, surrounded by vast areas of parking lots.

The general approach of the city towards urban industrial fields has been to wait for industries to move out, and then propose a conventional 19th century urban scheme of streets, plazas, and blocks on the empty land. This project argues that the strategic location of light industries, in proximity of urban areas and adjacent to transportation networks, can be considered beneficial in terms of efficiency, reduction of production costs, and energy consumption as a result of short distances of transportation of goods, services, and

1. Charles Waldheim and Alan Berger, “Logistics Landscape,” *Landscape Journal*, vol 27, no.2, (Madison: the University of Wisconsin Press, 2008), 219-246.

workforce. Moreover, due to the common nature of the activities, mostly consisted of light industries with a low degree of contamination, they are compatible to be integrated with other functions.

The project focuses on South Boston Industrial area as an example of such condition and explores hybrid typologies and geometrical patterns with the ability to expand and readapt to different scales and urban conditions. It suggests a new typology, which maintains industries on the ground level, in mega blocks adjacent to transportation networks, and proposes a stem structure, which runs through these mega boxes, providing access, infrastructure and service spaces for industries while creating a base for a new linear city on top. This stem also accommodates public facilities, parking, and a light public transit system, which can be connected to city subway system from certain nodes correspondent to scale of the development.

The project utilizes the industrial roof for different forms of agricultural and energy production. Due to the depth of big box roof structure, which allows shallow layers of soil and drainage systems to be incorporated, a form of light agriculture is possible. Having vast and continuous rooftops of mega boxes available, will make this local food production feasible and significantly decreases transportation costs. Different forms of energy production can also be investigated, depending on the context. Whereas in areas like California solar panels and heliostats can be installed on these roofs, in Boston and New York wind farms are advantageous.

The project attempts to devise principles, which can be adapted in similar conditions in different contexts. It suggests a new urbanism, which cultivates the potentials of existing underdeveloped urban areas and transforms them into hybrid fields of habitation and production. It is also an attempt for a sustained development within the urban realm to alleviate the further expansion of characterless sprawl.



Image courtesy of Google Earth



1. URBAN INDUSTRIAL LANDSCAPE OF AMERICA

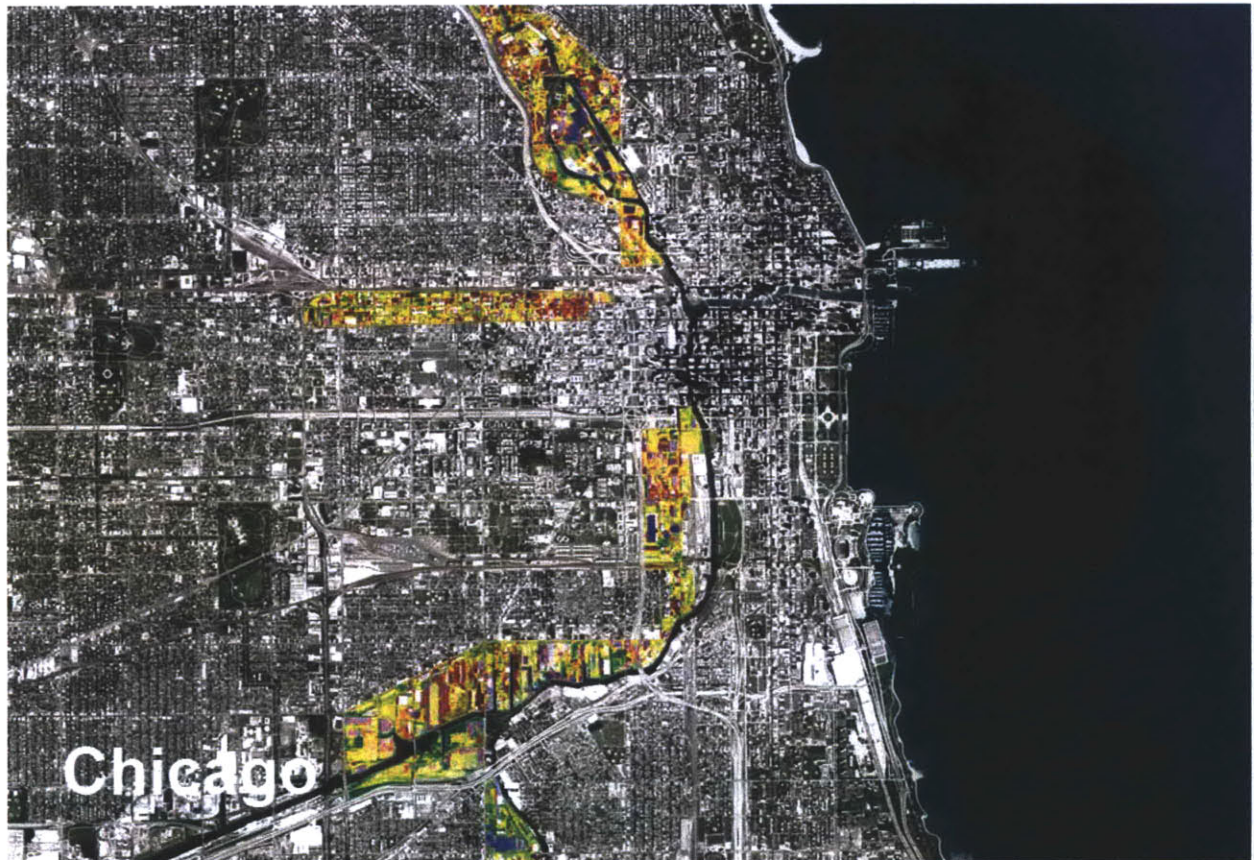
In his book, “The Making of Urban America,” John W. Reps, former head of the City and Regional Planning program at Cornell University, mentions the significant contribution of industrialization in urbanizing the United States: “New factories provided new jobs for new immigrants. Each additional person employed in manufacturing generated further employment in retail and service activities and eventually in secondary manufacturing. As employment increased, towns expanded to provide housing and the other physical requirements of the city life.”¹

However, this process is said to have changed, since service economy has largely replaced the industrial drive of major cities, leaving an abundance of abandoned factories and decaying infrastructure. For many years, the project has been to convert these landscapes to have them integrated with the city using conventional and previously experienced principles of urban design. But in the last three decades, due to forces of capitalism and global market, American city is facing a new challenge, which is significantly affecting its structure. This change is the emergence of a new industrial landscape dedicated to logistics and everyday consumer products, i.e. light industries.

In their article, “Logistics Landscape”, Contemporary Landscape Architects Charles Waldheim and Alan Berger distinguish three historical phases for the American industrial landscape: “concentrated in the late 19th century and early 20th centuries, decentralized in mid-20th century, and distributed at the end of the 20th century.” They argue that while the first shift was largely because of the process of decentralization and emergence of metropolitan territories, the second shift is a consequence of globalized economy and international supply change. Vast territories are now dedicated to shipment, preservation and transportation of goods. They call these areas, which have significant impact on urban form, “Logistics Landscape.”²

1. John W. Reps, *The Making of Urban America: a History of City Planning in the United States*, (New Jersey: Princeton University Press, 1965), 414.

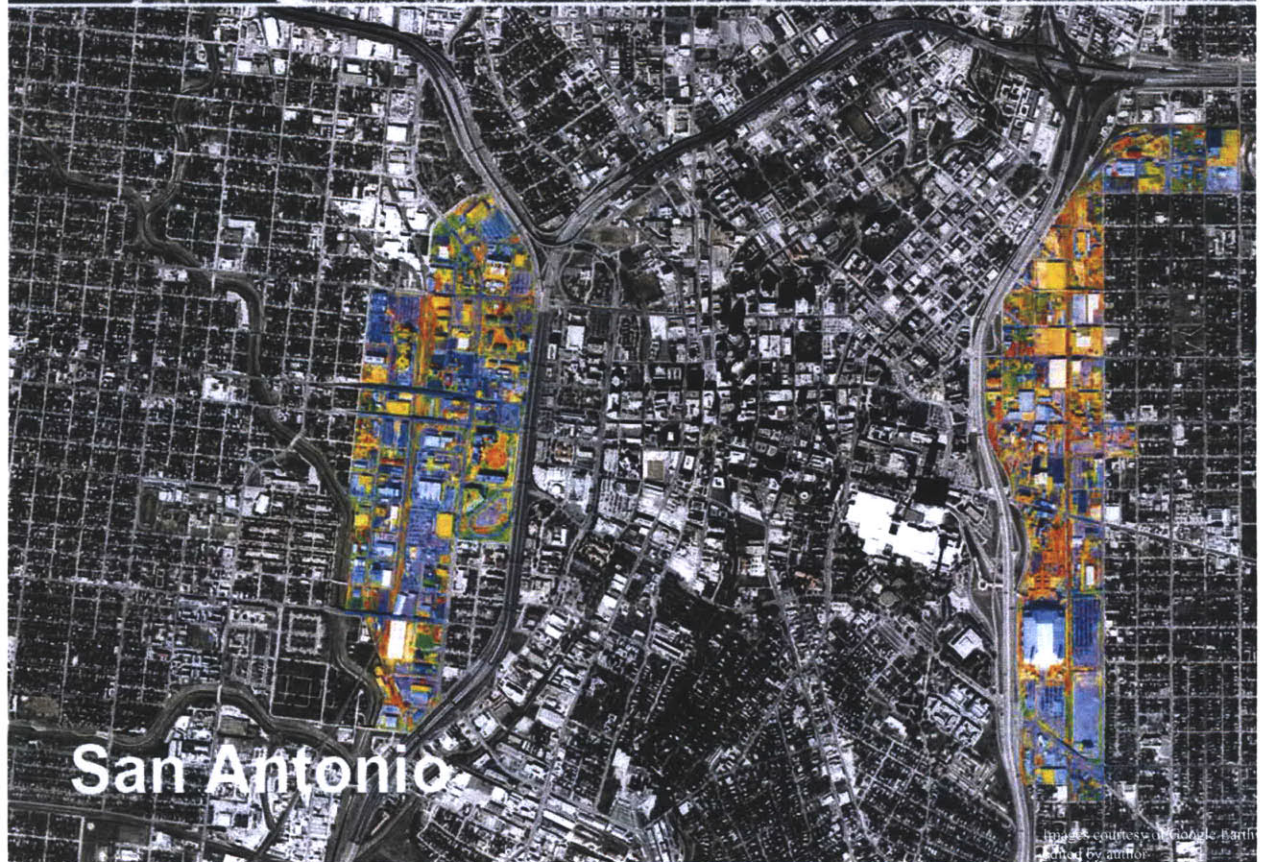
2. Charles Waldheim and Alan Berger, “Logistics Landscape,” *Landscape Journal*, vol 27, no.2, (Madison: the University of Wisconsin Press, 2008), 219-246.

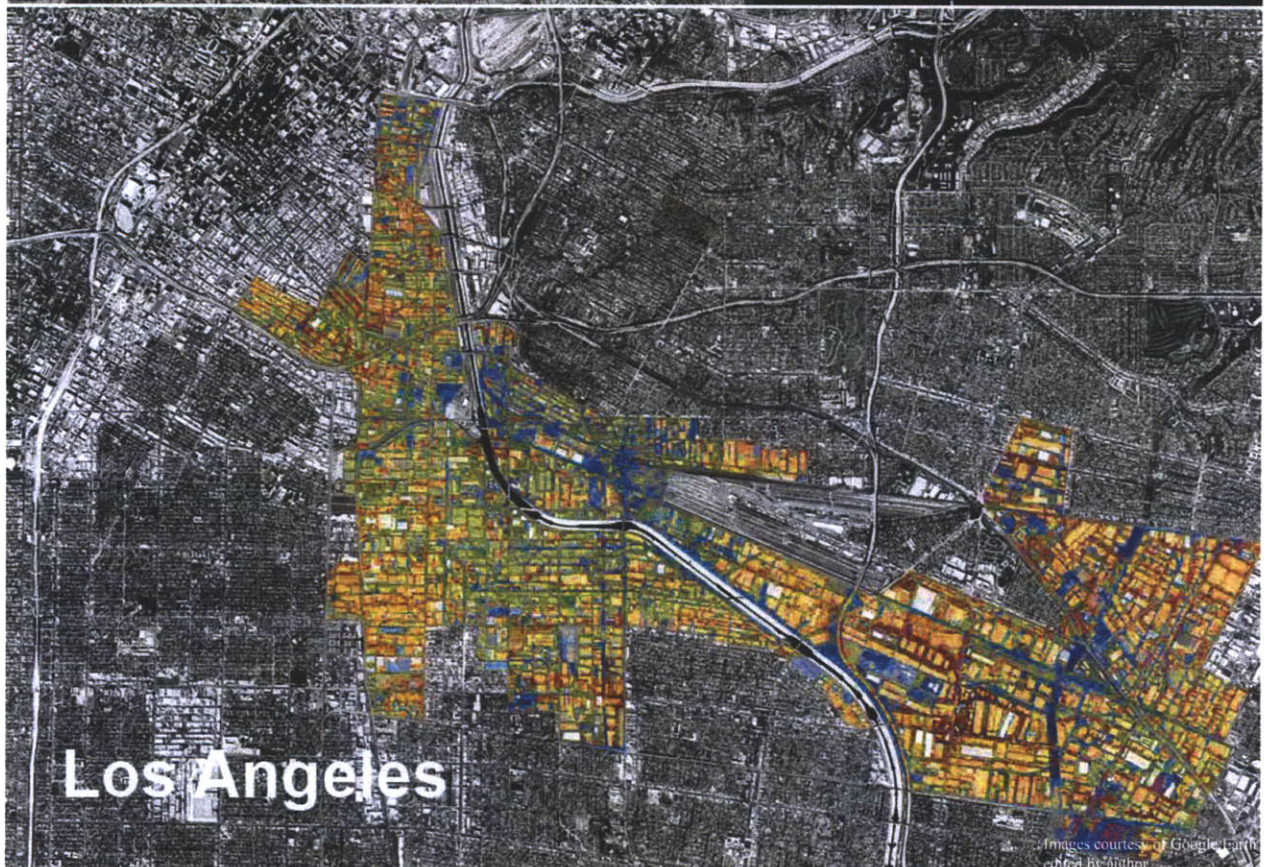
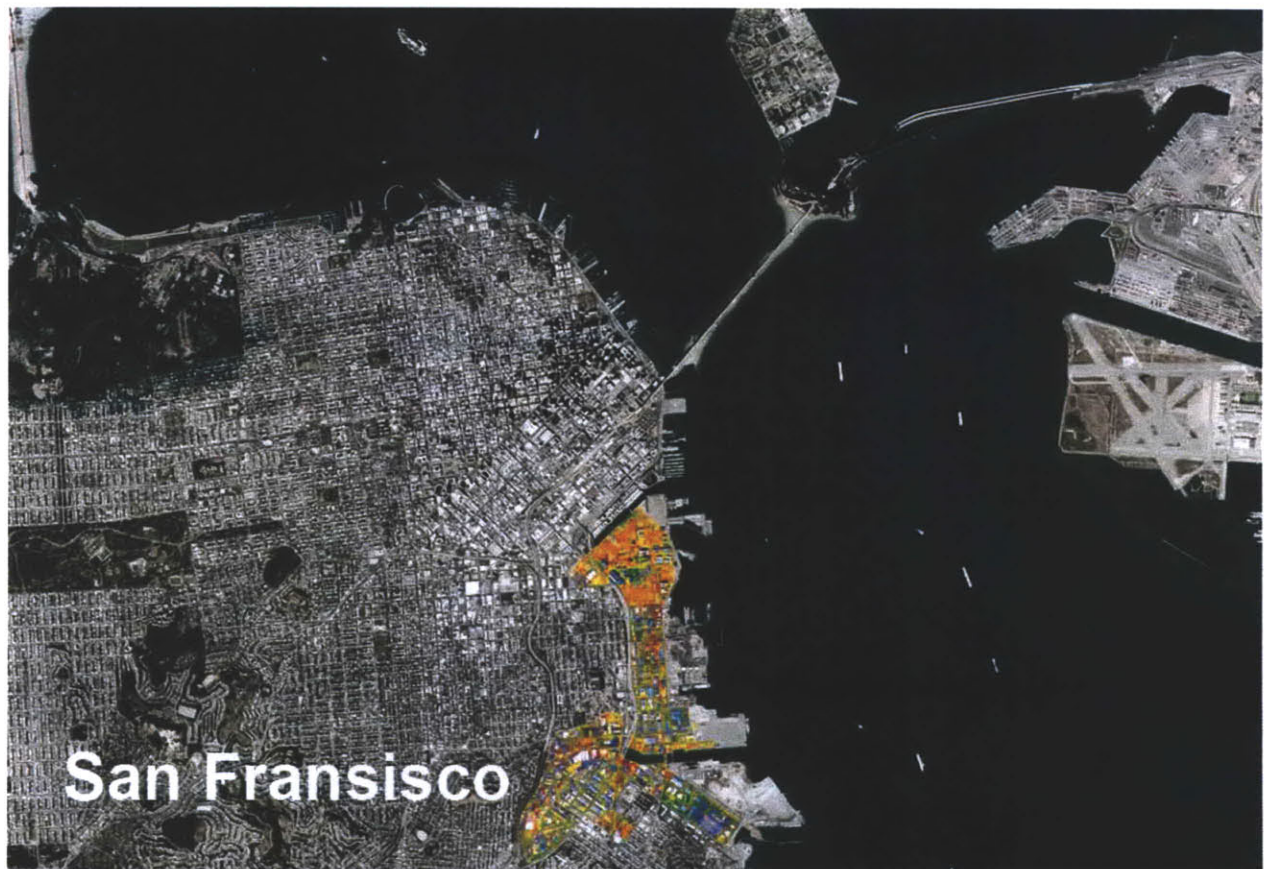


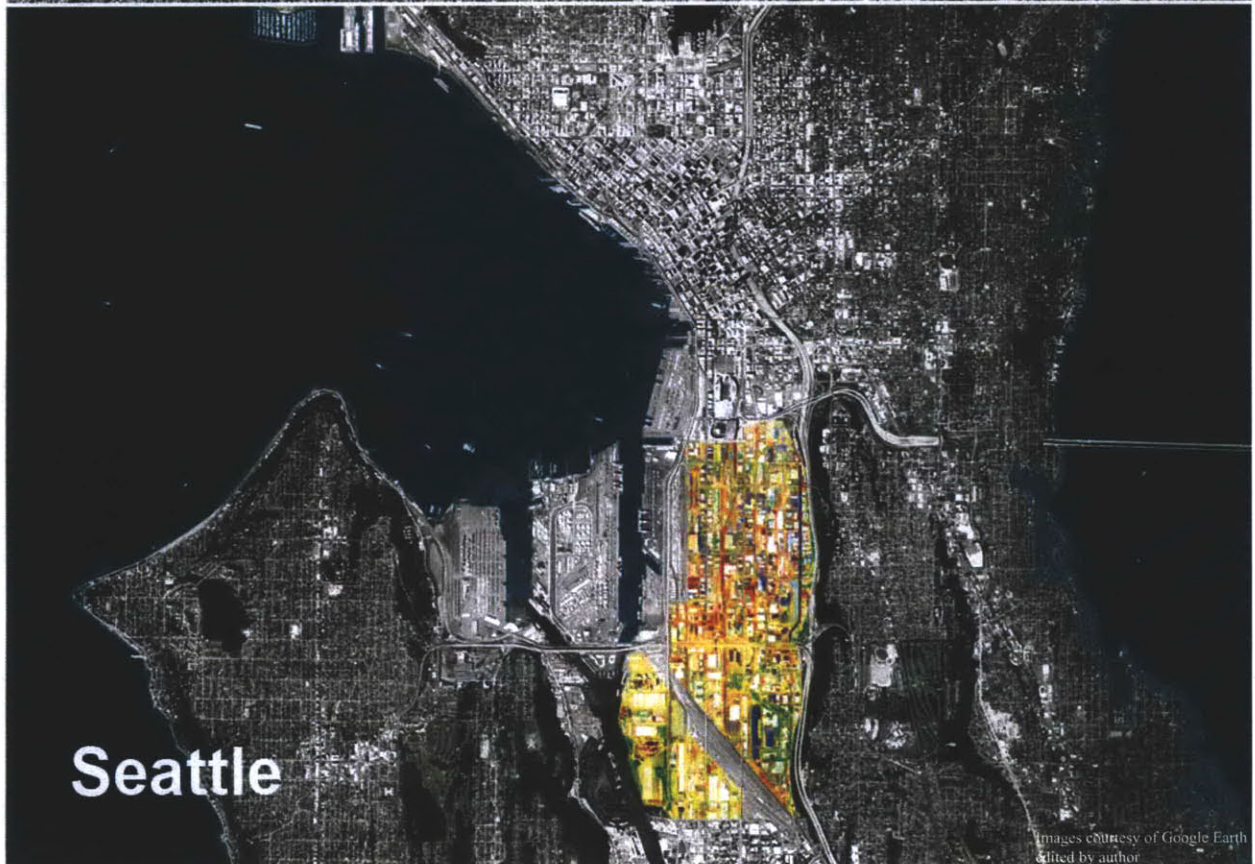
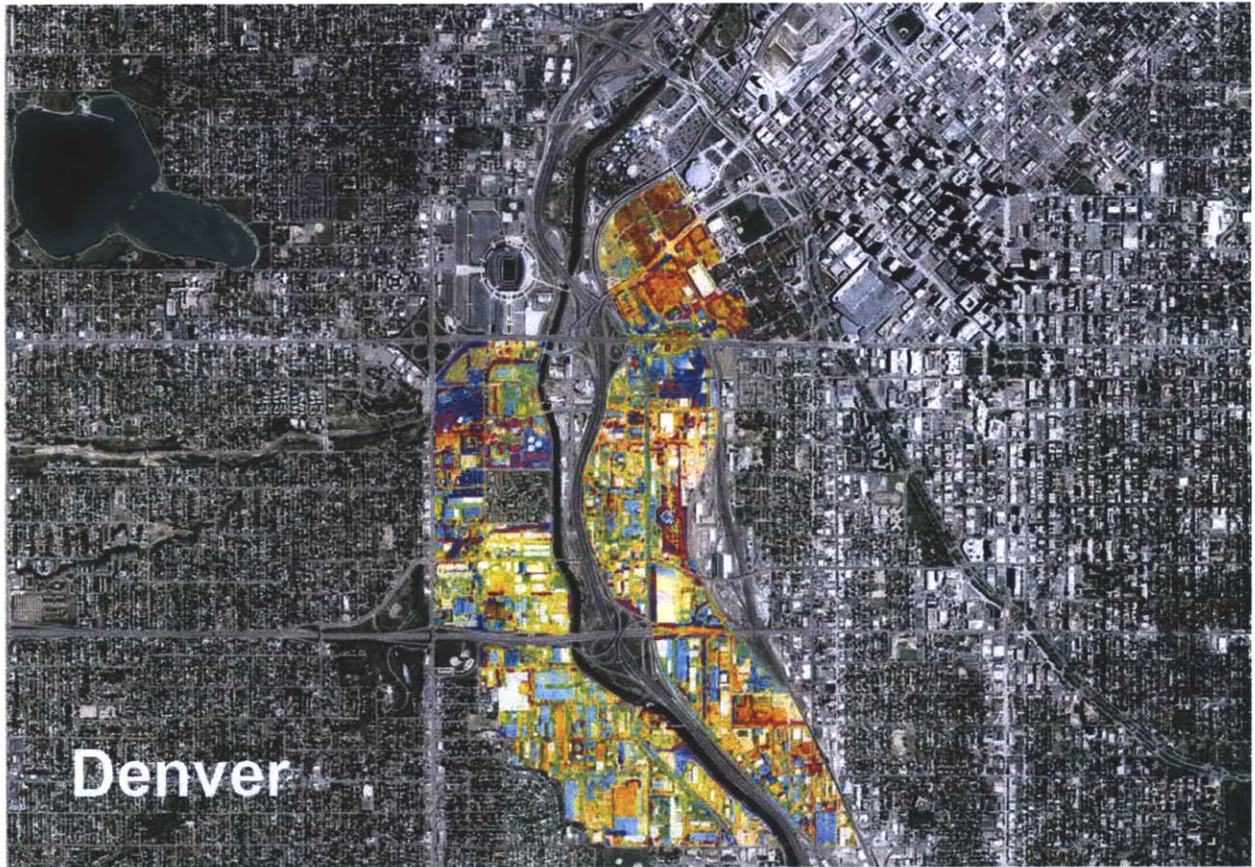
This new landscape is deeply reliant on networks of transportation and communication. Therefor it is strategically stretched along main arteries, river, and railroad system. Close mapping of major American cities show the significance of this new industrial footprint and its prominent location relevant to high-density downtown and medium-density residential areas. Intervened with the two, this industrial field provides necessary supply and service for urban areas surrounding it. This adjacency to urban areas has significantly facilitated their service, reduced the cost of products and decreased the consumption of energy for transportation of goods and workforce.

A closer look to the composition of these industrial fields reveals noticeable similarities in appearance, density, and function despite their different contexts. They have created identical vistas in different cities, consisting of one-storey big-box developments, surrounded by wide streets for truck circulation and massive parking lots. They are mostly dedicated to warehouses and industries which are categorized as “light”. As opposed to “heavy industries”, the products of light industries are for end users rather than other industries. This could include home appliance and furniture, clothes, food, etc. The important difference of light industries to heavy industrial operation is their low degree of contamination and environmental impact, which make them a better fit to be integrated with urban development.³

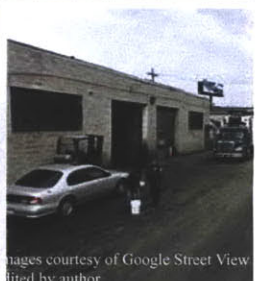
3. Arthur Sullivan, and Steven M. Sheffrin, *Economics: Principles in action*. (New Jersey: Pearson Prentice Hall), 493.



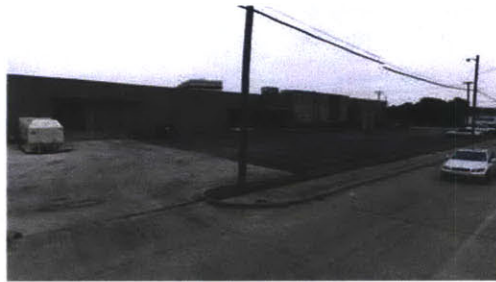




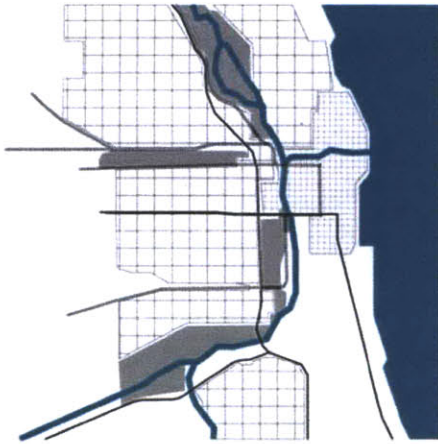
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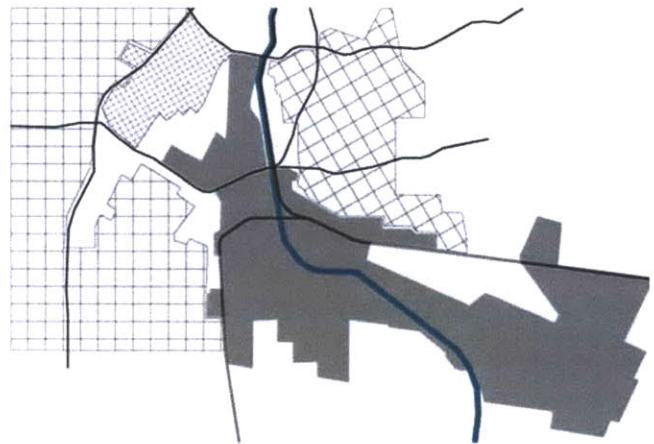
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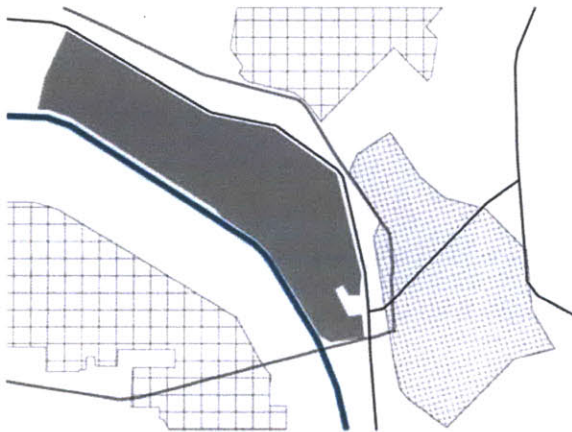
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CHICAGO



LOS ANGELES

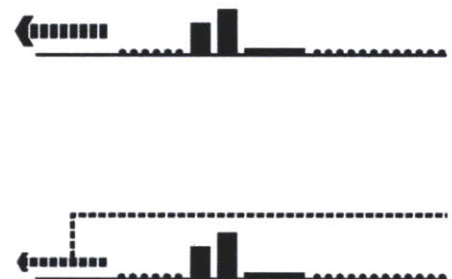


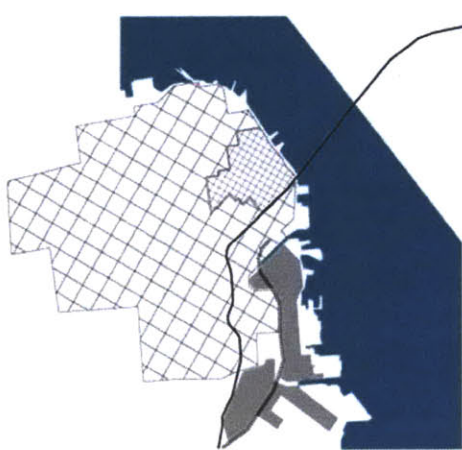
DALLAS



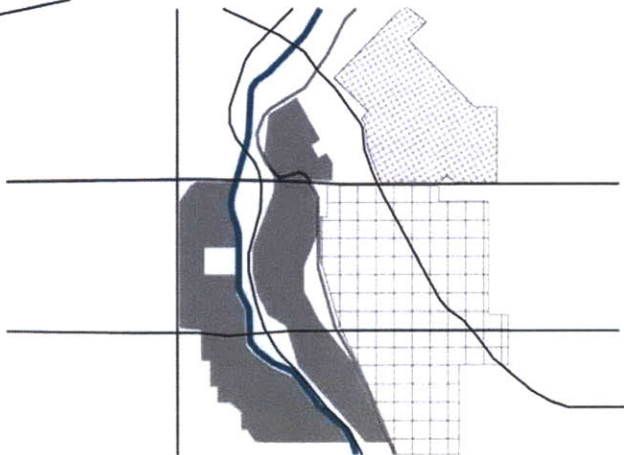
NEW YORK

Mappings show the strategic location of urban industrial zones in relation to downtown and medium density residential neighborhoods as well as their adjacency to networks of transportation, mainarteries, railroads, and water. As a result, a typical section for the American city can be conceived, where the industrial zone is located between high density and medium density urban fabric. Then there is sprawl, spreading outwards. Densification of these underdeveloped industrial territories not only reconnects the ruptured urban fabric, but also alleviates the rapid pace of suburbanization and expansion of characterless sprawl.

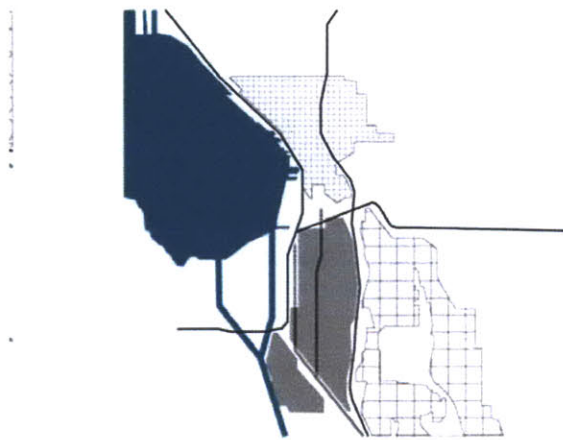




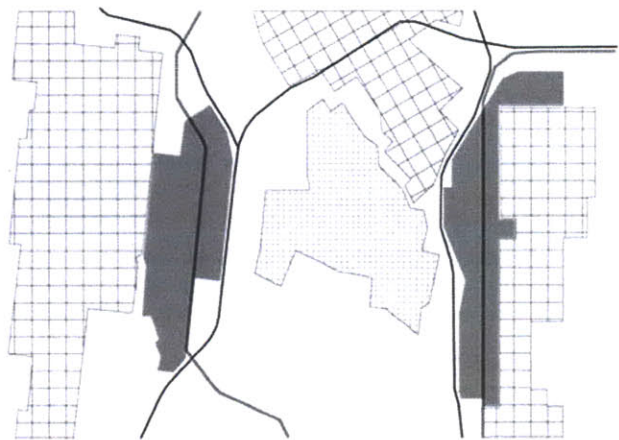
SAN FRANCISCO



DENVER



SEATTLE



SAN ANTONIO

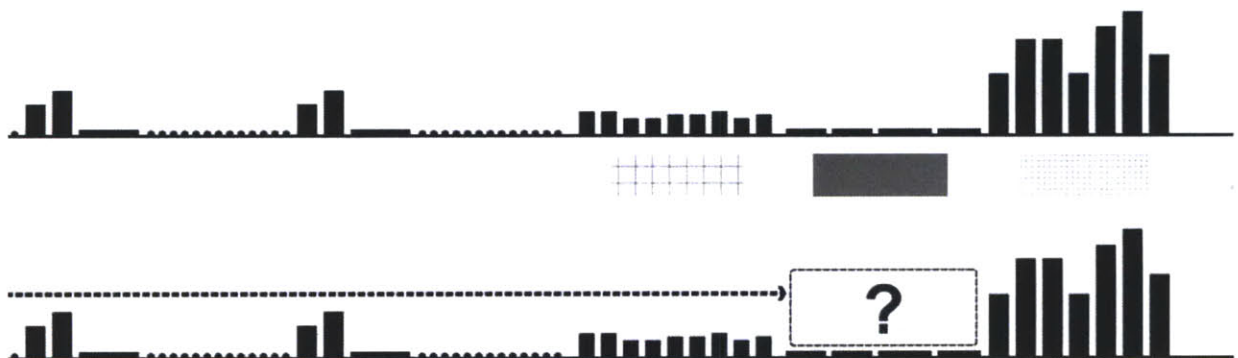




Image courtesy of Google Earth



2. THE BIG BOX

The face of American landscape has been drastically changed by the invention of big-box structures. These structures continue to capture a broad portion of new additions in the U.S. retail and industrial space. However, in the twenty first century communities are converting big boxes for new uses. Reprogramming these corporate structures is one of the many strategies, used to make the abandoned big box buildings useful after they have been vacated. Retail is not the only potential second life for the empty box. Around the country unused commercial space has been reused in creative ways. Former warehouse space becomes an indoor bike park. abandoned corporate big box structures become libraries, museums and schools.

The adjacent floor plate, repetitive structure and facade system, and the minimum amount of columns within the main space of these big box structures, are the few important structural parameters that maximize the exchangeability and flexibility of these buildings.¹ Increasingly, corporations are being forced to build retail structures with these adaptive capabilities, so that renovation and reuse of these structures could be more simplified. In his article, “The Case for the Big Box; Joys of a Non-Expressionist Architecture”, Alexander D’Hooghe discusses this advantage of adaptability: “[...]shedding commercial and vital expressions from the architectural shell of the box and merely becoming an enclosed stage for framed scenes of everyday life. Ultimately the big box is a large platform; a stage as a separate space where when external everyday objects suddenly appear, they are filled with new meanings”.² Communities attempt to adapt their activities to these vacant big boxes and reprogram these structures according to their needs.

1. Alexander D’Hooghe, “ The Case for the Big Box; Joys of a Non-Expressionist Architecture,” *Volume*, no.19, (the Netherlands: Archis 2009), 32.

2. *ibid*, 38.



Images courtesy of www.bigboxreuse.com

The Sugar Creek Charter Elementary School
Renovated K-Mart
Charlotte, NC

The Spam Museum
Renovated K-Mart
Austin, Minn.

Big box reuse, relies not only on it's structural characteristic but also on it's site-specificity. As it has been discussed in many articles, specially in Julien Christensen book "Big Box Reuse", these structures are not related to any historical background, rather each big box is part of a corporation - specific, "Multi sited" experience which makes it more adaptable and flexible.³

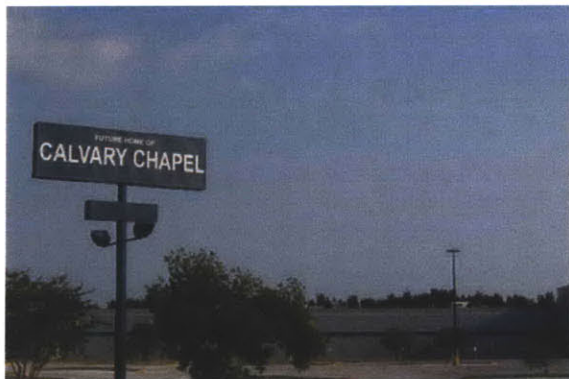
These big box structures typically shift the cultural ecology of a space and existing terrain. They bring with them a series of complementary developments including maintaining public roads and highways to facilitate the access. When a big box retailer moves into town, spotlights are put into place, roads are built, exits off the highways are constructed so that the costumers have easy access to the store. When the retailer moves across town, all the infrastructure is left in place, making the location ideal for any number of civic uses.

As towns become less reliant on everything being within walking distance, and more reliant on access from the highway, these structures are becoming the new town center. As Joel Garreau also discusses this condition in his book "Edge Cities":

"preservations often tolerate big box buildings because of their economic potential and consumer convenience, as long as they are kept safely on the edge of the town. However there is often such immense investment in the infrastructure and activity surrounding these lots that what we see is these edges actually becoming new town centers. Today the edge is emerging as a new center in rural towns that seem too small for suburbs."⁴

3. Julia Christensen, *Big-Box Reuse*, (Cambridge: MIT Press, 2008), 1-9.

4. Joel Garreau, *Edge City: Life on the New Frontier*, (New York: Anchor, 1992), 45.



The Calvary Chapel
Renovated Wal-Mart
Pinellas Park, FL

The Jen Library
Savannah College of Art and Design
Savannah, GA

Images courtesy of www.bigboxreuse.com

The significant paradox, embedded in defining the big box is what Alexander D'houghe refers to as “Permanent Semantic Expression vs. Durable Architecture of the Box”. In other words, big box is a typology that is impermanent relying on it's program and usage. Its aesthetic is completely independent from its program. But at the same time it is a sustainable and durable structure, considering its internal flexibility and inexpensiveness of its construction which is designed to convey temporality.⁵

This internal flexibility versus stability of outside shell, has lead to the comparisons of the idea of “The Duck” and “ The Decorated Shed”, introduced by Robert Venturi and Denise Scott Brown. It has been argued that turning into a “Cultural Symbol”⁶, has made the big box structure “The Duck”; A typlogy in which there is direct relation between the program and the form. However, the neutrality of this structure, implies the idea of the the “Decorated Shed”; A typology in which there is no specific relation between the program and the form without the use of decoration and signs.⁷

5. Alexander D'Hooghe, “ The Case for the Big Box; Joys of a Non-Expressionist Architecture,” *Volume*, no.19, (the Netherlands: Archis 2009), 34.

6. Julia Christensen, *Big-Box Reuse*, (Cambridge: MIT Press, 2008), 1-9.

7. Robert Venturi, Denise Scott Brown, and Steven Izenour, *Learning From Las Vegas: The Forgotten Symbolism of Architectural Form*, (Cambridge: MIT Press, 1977), 54.



The Guitar Center
Renovated Home Depot
New Orleans, AL



The RPM Indoor Raceway
Renovated Wal-Mart
RoundRock, TX

Images courtesy of www.bigboxreuse.com

Don't trash big boxes. Repackage them.⁸

In 2008, Washington Post assembled a small team of artists, architects, engineers and developers to think creatively about what to do with these structures. The assignment was to come up with ideas that were creative, contextual, and of the moment. Participants focused on different aspects of these structures to explore different potentials. The common feature of all proposals was “re-use”. None of them proposed an alternative based on maintaining the industrial or logistic operation.

8. Joel Garreau, “Big Box & Beyond, Today's Templates of Consumption Don't Have to be Tomorrow's Ruins. What's in Store?” *Washington Post*, November 16 2008, www.washingtonpost.com/wp-dyn/content/article/2008/11/13.

Build a Town in the Parking Lot

(Christopher B. Leinberger and Darrel Rippeteau)

The project proposes the placement of parking garages at the core of the big box structure, and encrust those with an outer layer of shops and apartments on all sides, that makes on block. Putting together a whole brunch of these blocks, with the shops and apartments facing each other across the newly defined streets, creates a part of the city. The proposal also contains residential and offices on over the retail structures.

The Estates at Place W

(Roger K. Lewis)

The proposal deals with the openings of the big boxes, windows. It propose the core out of the center of the big box, to create internal garden, addition of windows around the interior walls in order to lay out the residential units.

The Garden of Gaithersburg

(Darrel Rippeteau)

The proposed reuse is the creation of a truck garden, in which the parking lot becomes an orchard with a network of drainage pipes underneath.

FLEXIBLE RESIDENTIAL ARRANGEMENTS

Image courtesy of Christopher B. Leinberger and Darrel Rippeteau

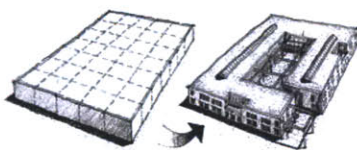
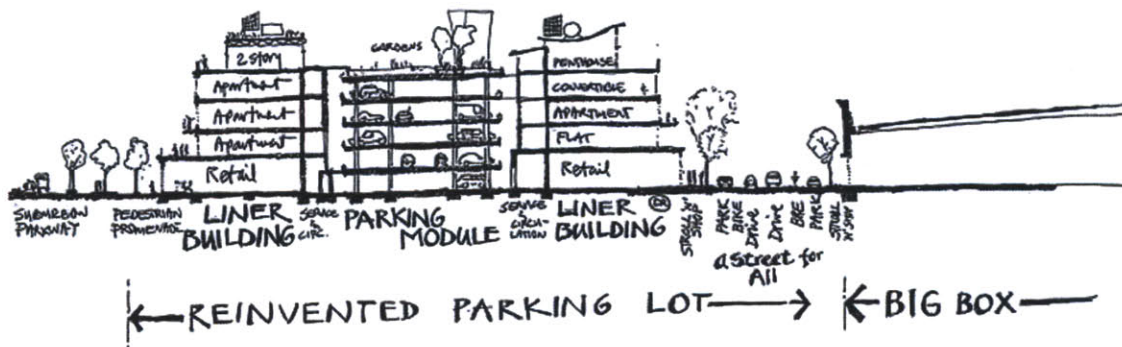


Image courtesy of Roger K. Lewis

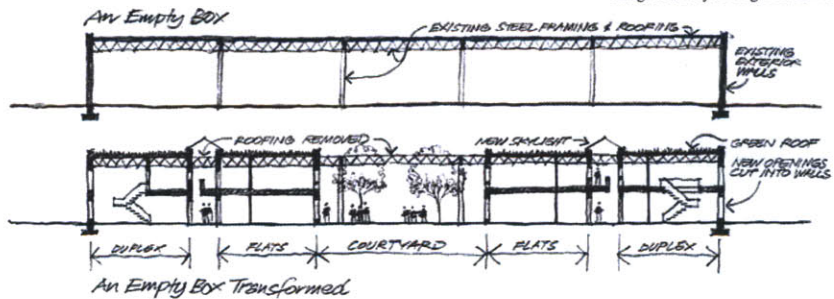
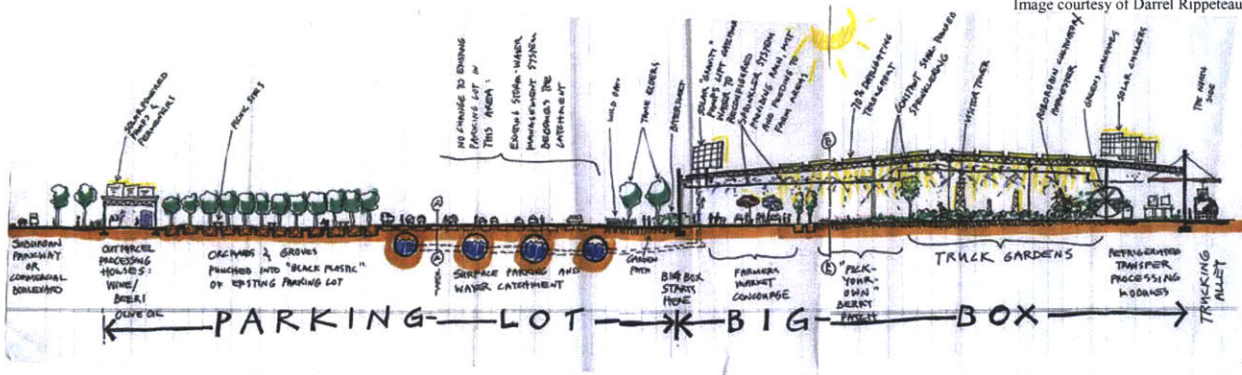
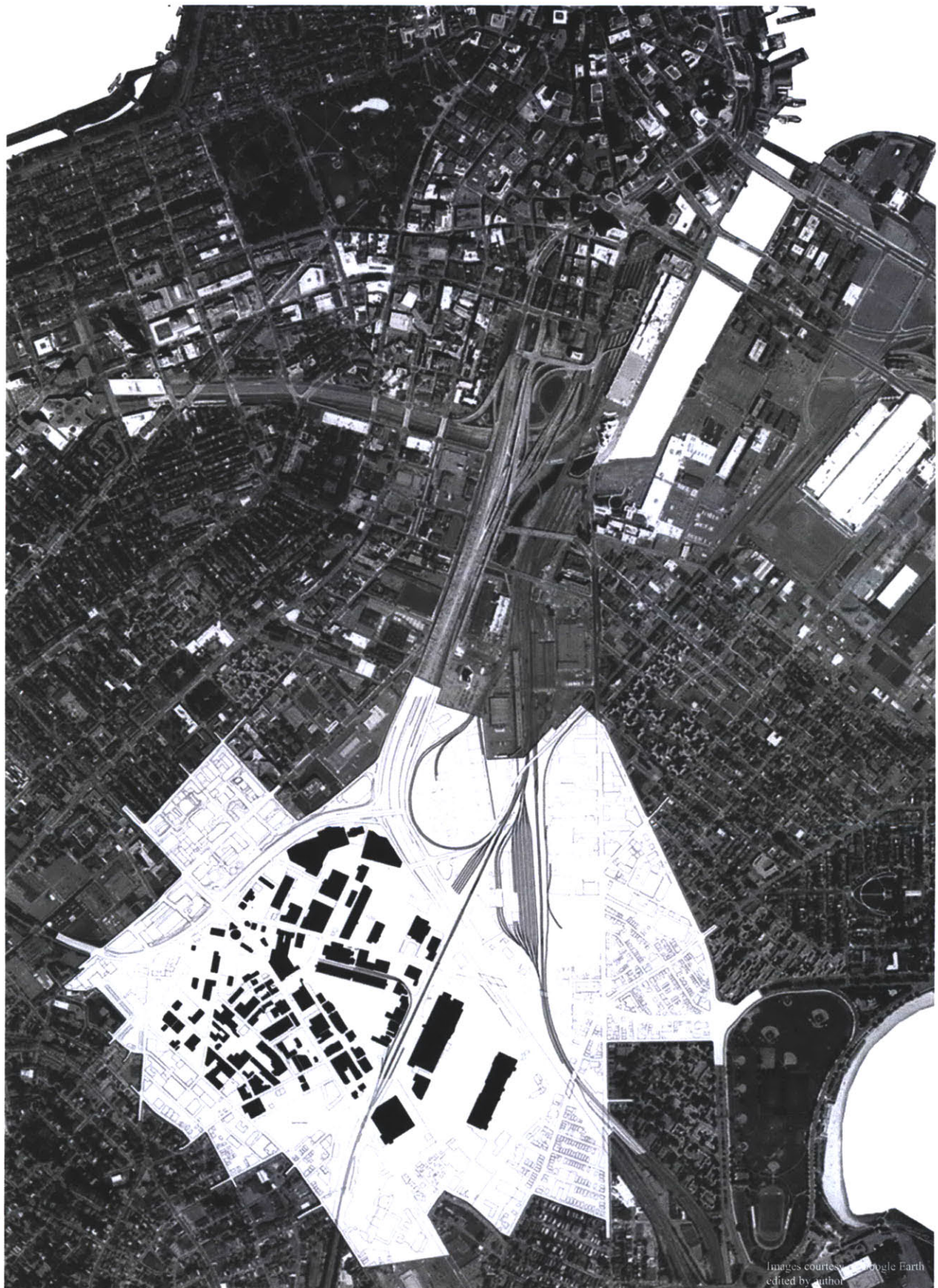


Image courtesy of Darrel Rippeteau







3. THE PROJECT



Westside Crossing
Status: Under Review
Description: 300-foot road, 47,000 sq ft parking, 100,000 sq ft retail and 400 parking spaces.

Residences at 271 Street
Status: Board Approved
Description: Proposed development consists of 180 residential units, 10,000 sq ft of retail space, and 400 parking spaces on G Street.

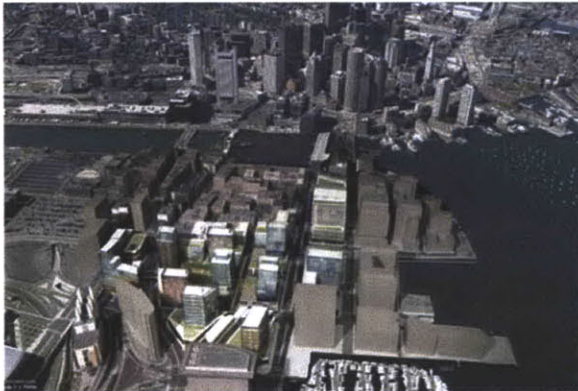
Target South Bay Expansion
Status: Board Approved
Description: The corporation proposes to expand and reconfigure the existing building and add back of house space and improve existing parking. The existing target location is the South Bay area. Approximately 21,000 sq ft of new space will be added.

Images courtesy of Boston Redevelopment Authority
edited by author

Typically the projects defined for these lands are conventional urban schemes, consisted of residential and commercial blocks with pedestrian friendly dimensions, public parks, Plazas, and shopping malls. As mentioned, all of these are conceived based on the premise of dealing with a tabula rasa condition when the industries have left the area. The aim of this project is to challenge a condition, in which light industries can operate in full scale, due to their advantageous and strategic location and use this condition to imagine new typologies; a new urbanism which fuses urban development and industrial production and uses the benefits of this mergence.



Images courtesy of Boston Redevelopment Authority
edited by author



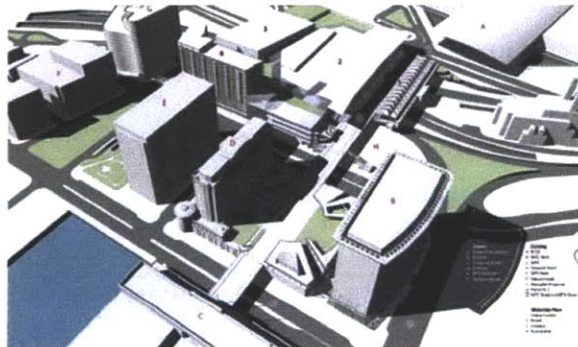
Seaport Square



Fort Point District



Waterside Place



Old Colony Phase I



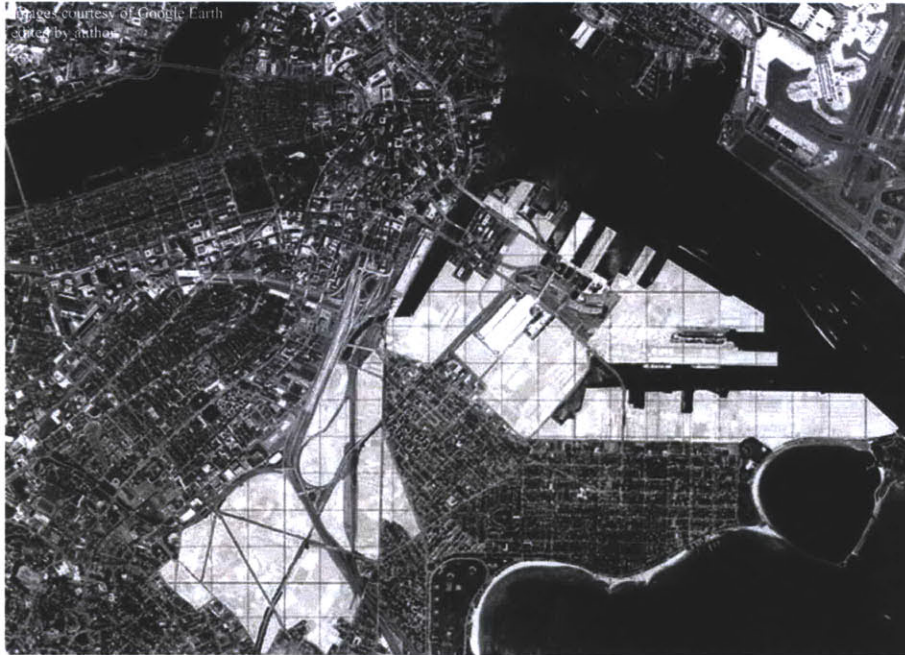


fig1. Boston industrial area stretched from Roxbury to South Boston Waterfront

The project started by analyzing the site. As shown in fig.1 Boston industrial area is stretched from Roxbury neighborhood to South Boston Waterfront. The area can be considered as an archipelago isolated from the city by dense networks of transportation, i.e. highways and railroads, and vast areas of parking lots and abandoned warehouses. This stretch of land has ruptured the city to northern and southern part as shown in fig.2. As mentioned the area chosen for the site is in Roxbury, where there is ongoing industrial operation. It also has a close proximity of 1.4 km to Silver Line last station (Roxbury Crossing). Therefore any future development in this area can be

fig4. existing industries

Images courtesy of Boston Redevelopment Authority
edited by author

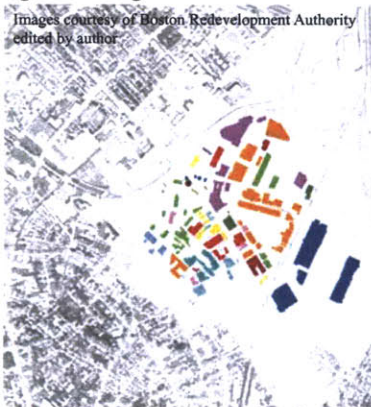
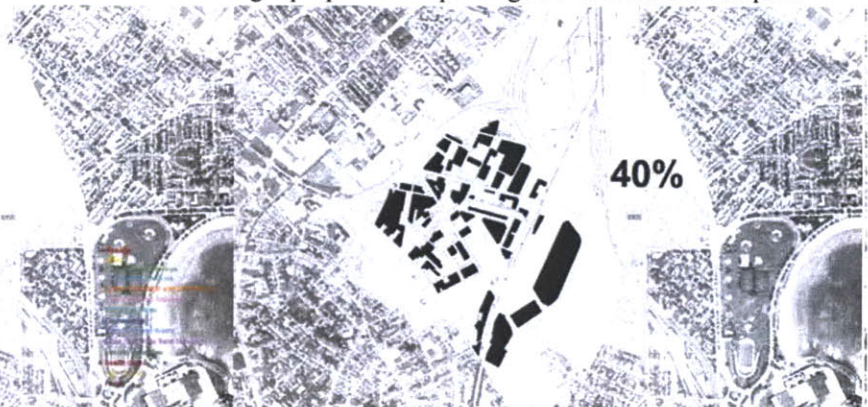


fig5. proportion of parking lots to industrial footprint



maps courtesy of Boston Redevelopment Authority
edited by author

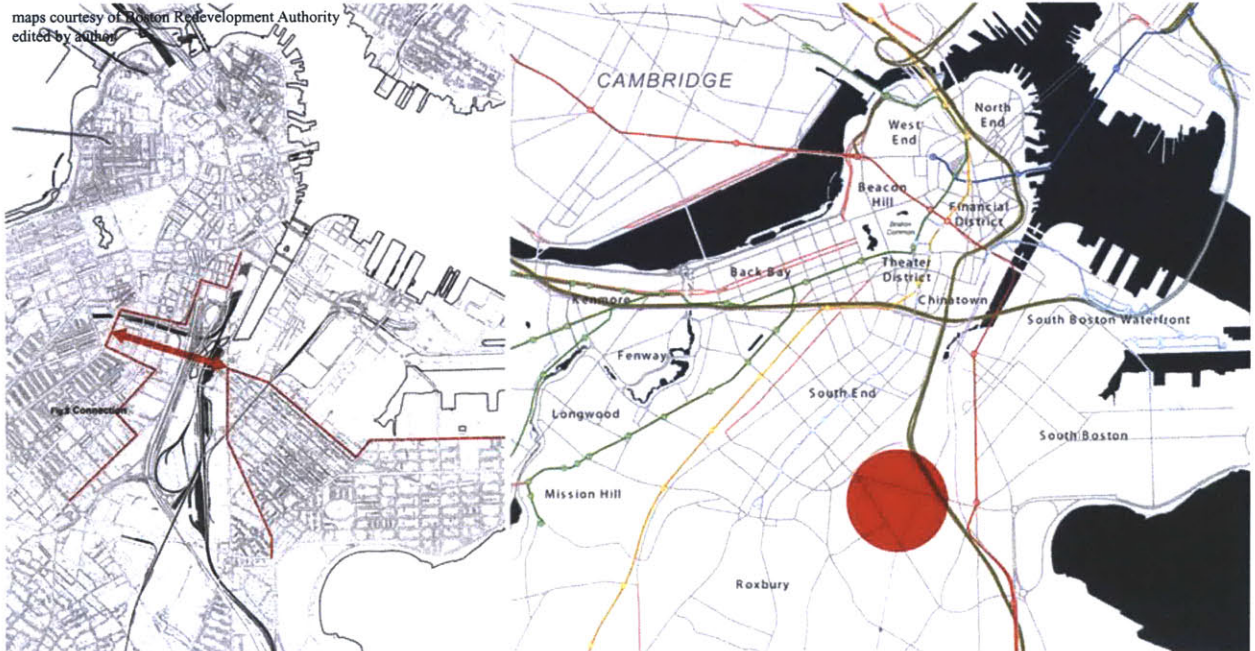


fig2. industrial area rupturing urban fabric

fig3. proximity of the site to Boston subway system

considered to become easily integrated to Boston subway system.

fig.4 shows the existing operating industries, mostly dedicated to food production, warehouses, and logistics. Significant portion of the land is dedicated to parking for cars and trucks, which has deteriorated the urban condition fig.5. As illustrated in fig.6, a public park in the southern part and state buildings, fire station, and a police office in the northern side are major nodes that should be preserved and incorporated in the new scheme. fig.7 shows the primary and secondary street pattern. This study was used to define the main boundaries of the project.

fig6. important points

Images courtesy of Boston Redevelopment Authority
edited by author



fig7. existing street pattern



■ state buildings
■ public park

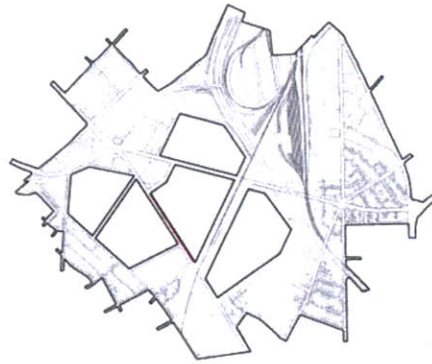
By eliminating the secondary street pattern, mega boxes can be conceived as containers of industrial operation on the ground level. This strategy will significantly reduce the amount of wasted land because of the abundance of secondary streets. It also has the advantage of centralizing the operations with common access to the major road system, which facilitates operations.



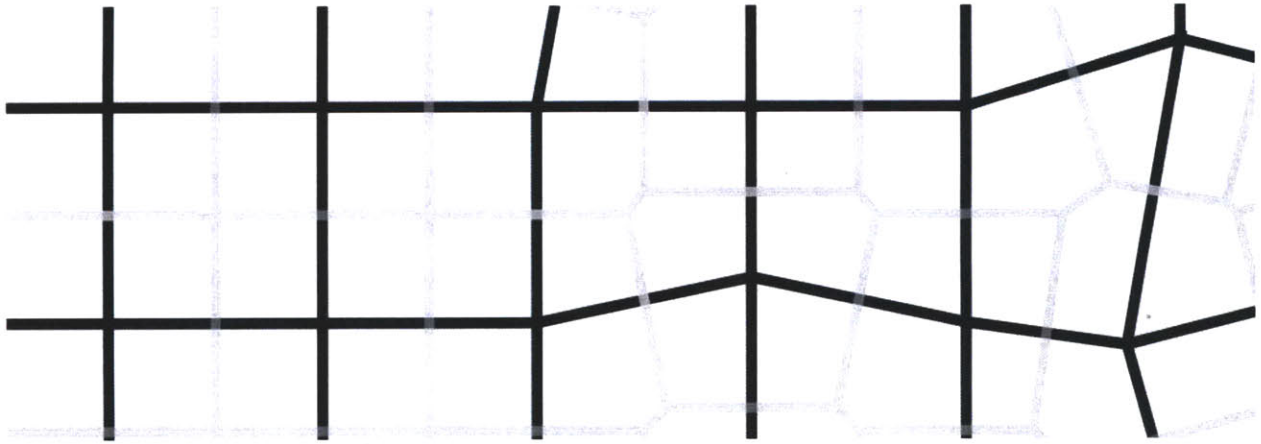
Image courtesy of Boston Redevelopment Authority
edited by author

By inverting the pattern, two different schemes of hybrids can be envisioned which are titled Urban Enclaves vs. Superstructures and Landscapes of Production. In the first scheme, industries are organized on the peripheries of isolated urban enclaves, each with a distinct character. While industries have direct access to existing roads, the enclaves are connected through an underground stem structure, consisting of a light transit system and parkings. In the inverted scheme, the stem structure becomes the city on top of industrial mega boxes, providing access and service to both industries and the city on top. The advantage of the second scheme to the first is that it provides flat surfaces, which due to deep structure of the industrial roof, can be cultivated by forms of light agriculture and energy production.

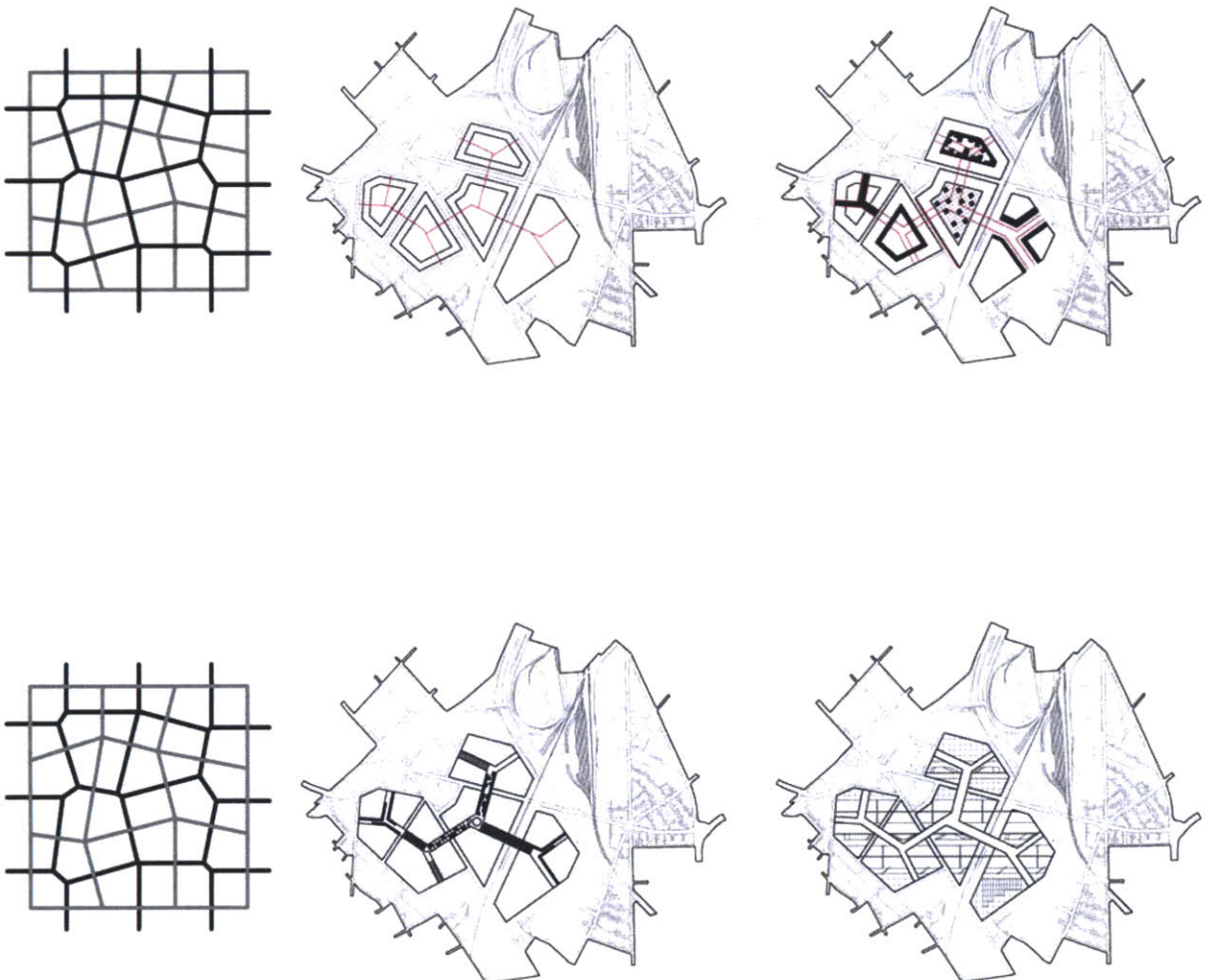
URBAN ENCLAVES



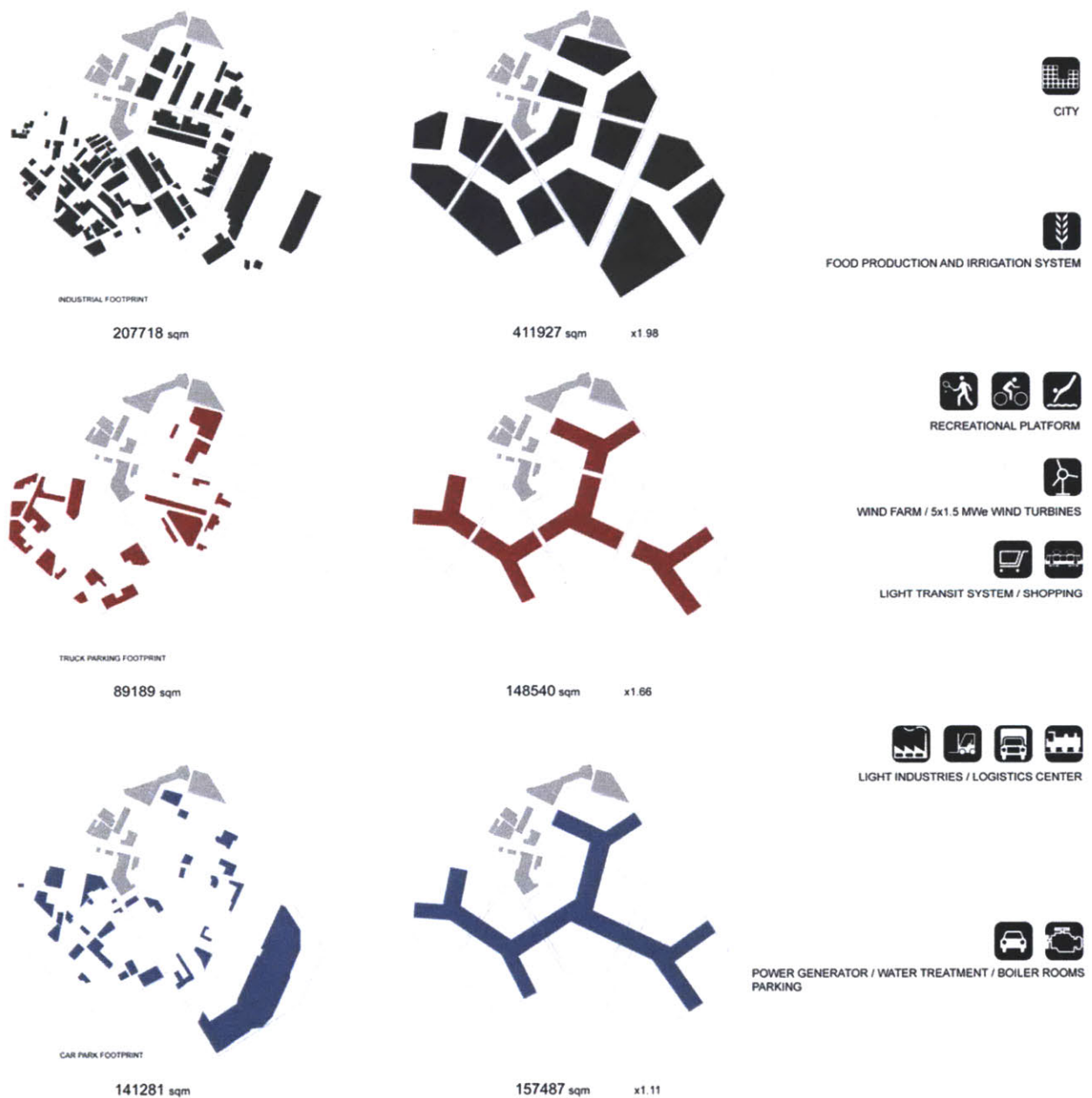
✓ SUPERSTRUCTURES AND LANDSCAPES OF PRODUCTION



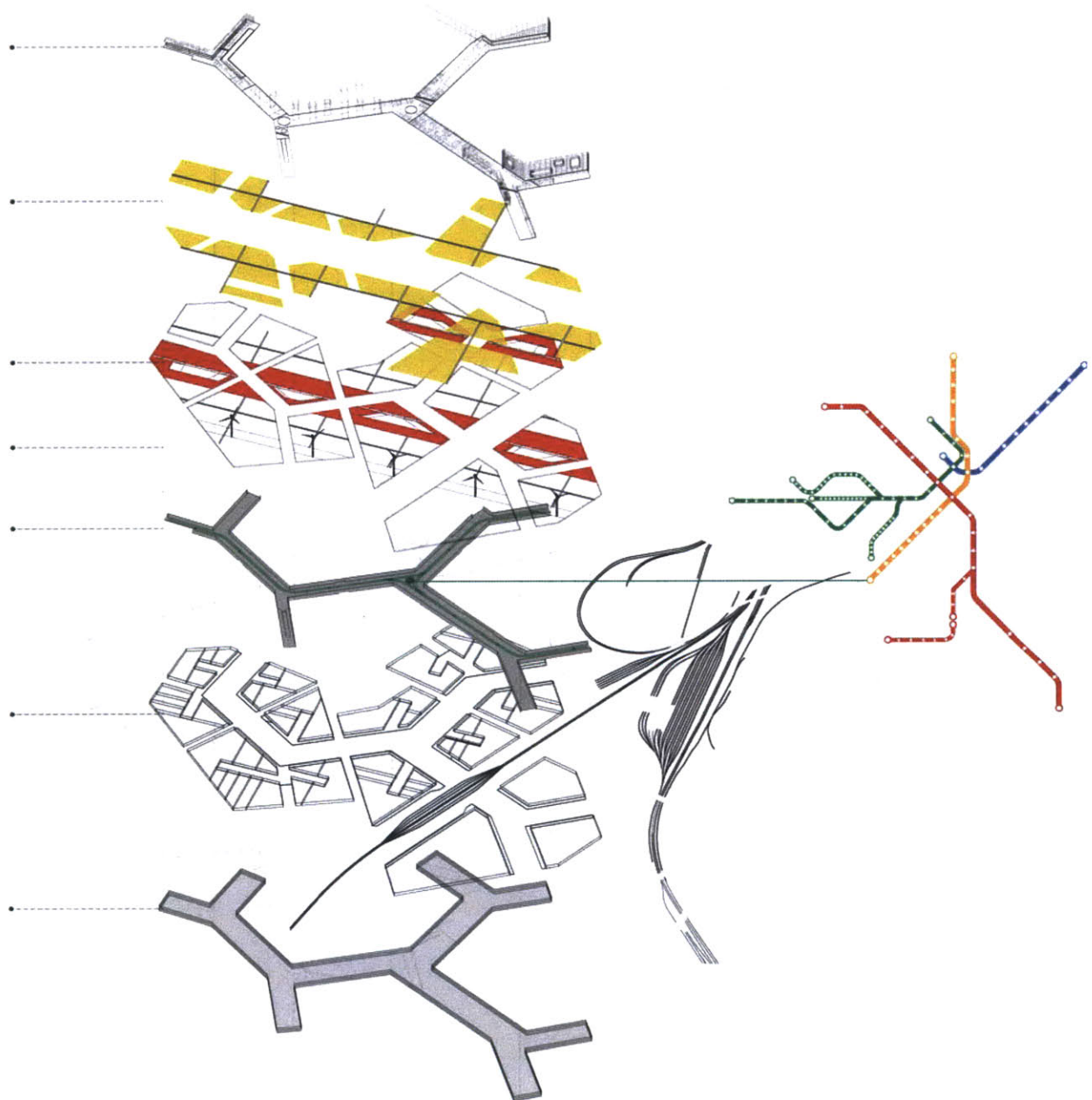
In order to organizing different functions, a certain pattern is explored because of its advantage in adapting to different urban fabrics, i.e. orthogonal in western cities, irregular in the east coast. The two superimposed networks can be imagined as superimposed systems of industrial operation and human habitation.



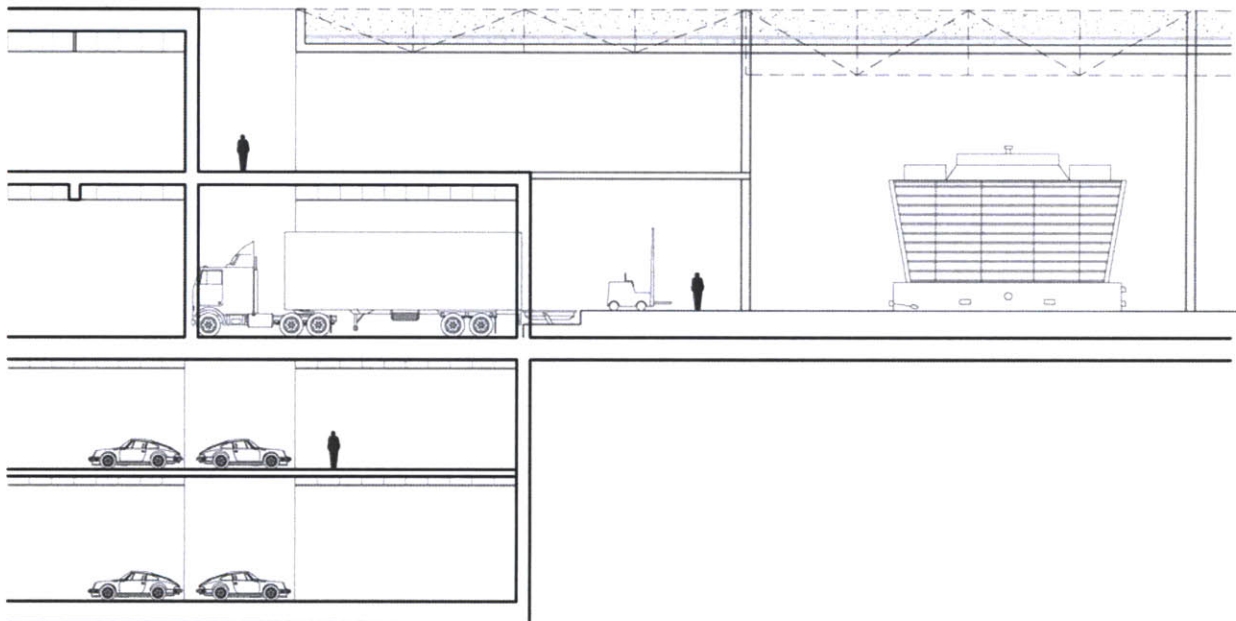
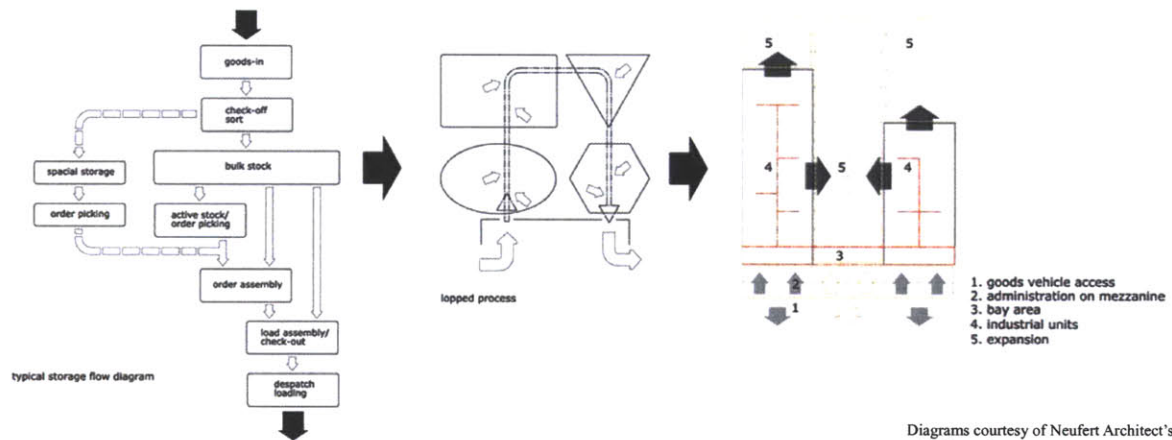
Comparisons between the existing condition and the proposed model shows a significant advantage for the new scheme over the existing. Due to the elimination of secondary roads and efficiency of circulation, it doubles the space dedicated to industrial activity as well as the space for trucks.

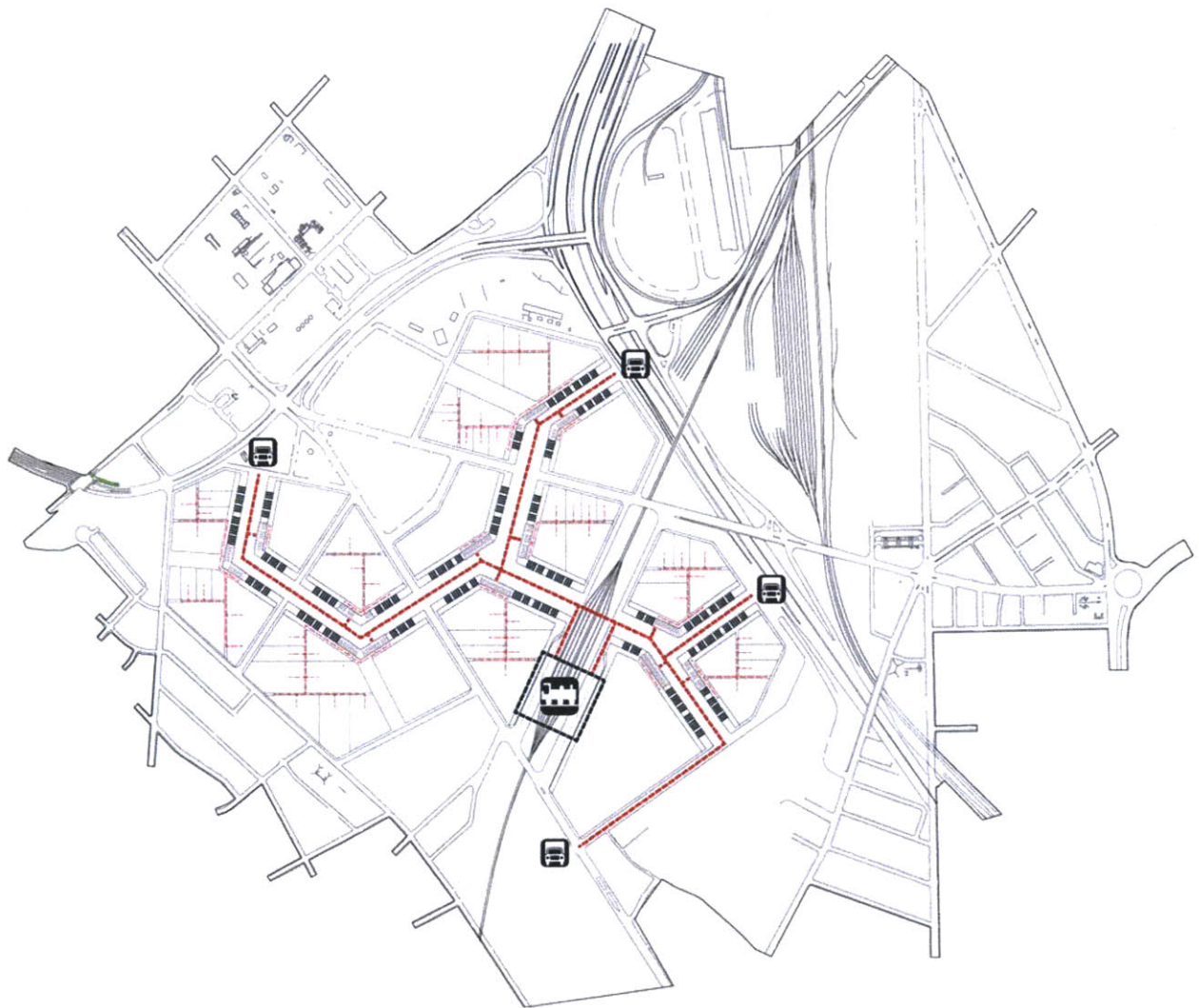


The layer diagram shows vertical axonometric of the scheme. Underground level is dedicated to mechanical and electric systems as well as car parks. The ground level is for industrial operation. On top there is a light-transit system with the potential to extend based on possible future development. This system can be connected to city public transit system from certain nodes, correspondant to the scale of the scheme. On the industrial roof, different form of agriculture and energy production can be concieved. In case of Boston, because of the advantage of wind, a wind farm consisted of five 1.5 Mwe wind turbines is designed, which can cover electricity for approximately 3000 households. On top of the stem platform, a linear city, consisted of mixed-use structures is imagined.

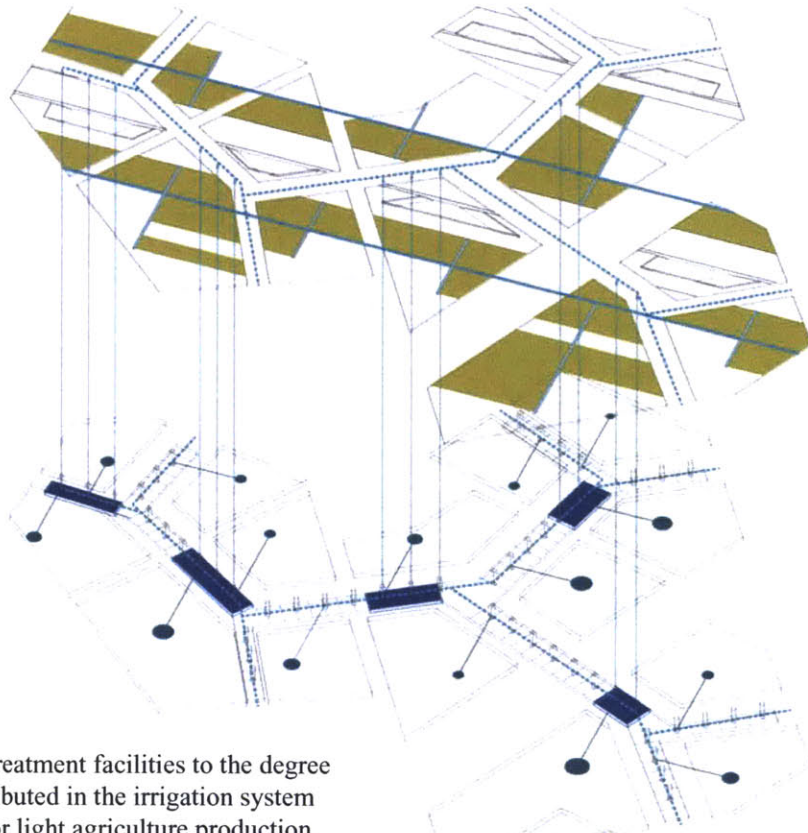


Studies show that the process of unloading materials and loading products can be organized in a loop, so that one bay area can be used for both purposes. This will lead to a certain organization which can be adapted in our scheme, where each mega box is divided to three groups of smaller industrial units with common access to a bay area. As shown in the section below, trucks can load and unload in the bay area, where forklifts are used to convey goods to and from industrial units.

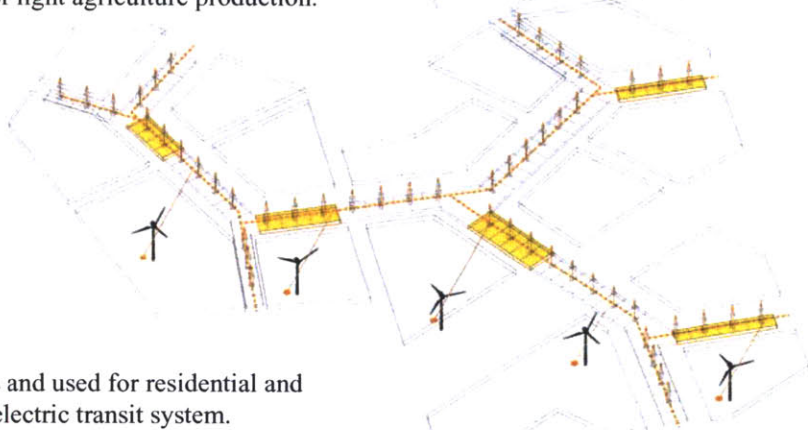




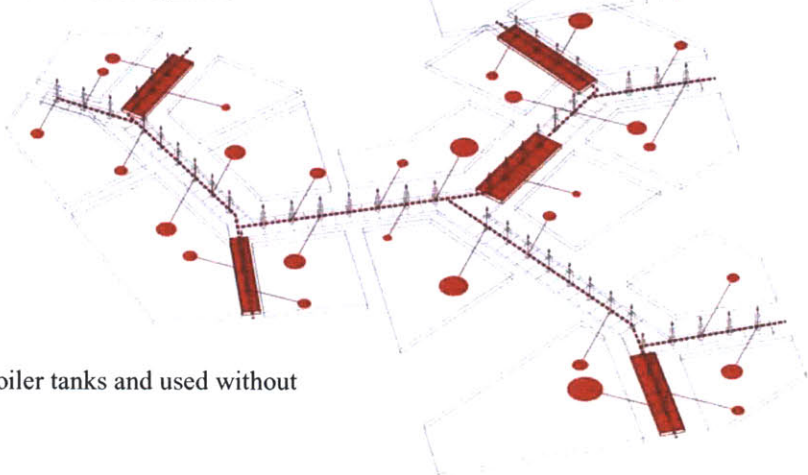
This map shows the circulation of trucks and how materials and products are being transported to and from the complex. The stem structure acts as the main transport hub, giving access to all industrial units and consisted of parking space for trucks, waiting areas, and bay areas. It also gives access to a new cargo train station, which connects this center to other local and regional nodes of logistics.



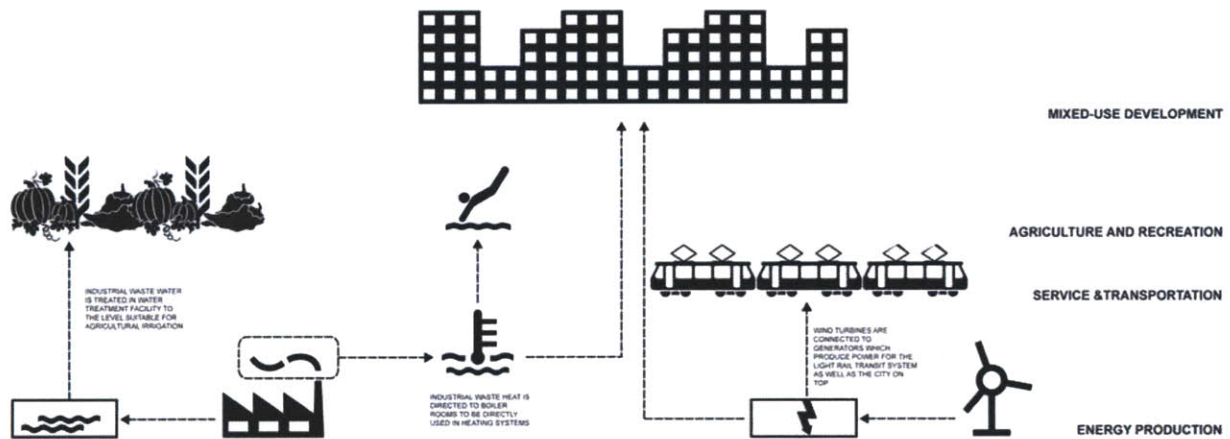
Industrial waste water is treated in treatment facilities to the degree suitable for agriculture, then is distributed in the irrigation system incorporated in the industrial roof for light agriculture production.



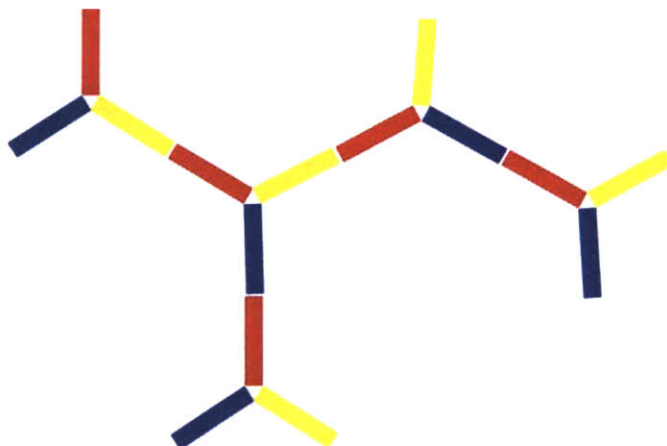
Power is generated by wind turbines and used for residential and commercial use as well as the light electric transit system.



Industrial waste heat is directed to boiler tanks and used without conversion.

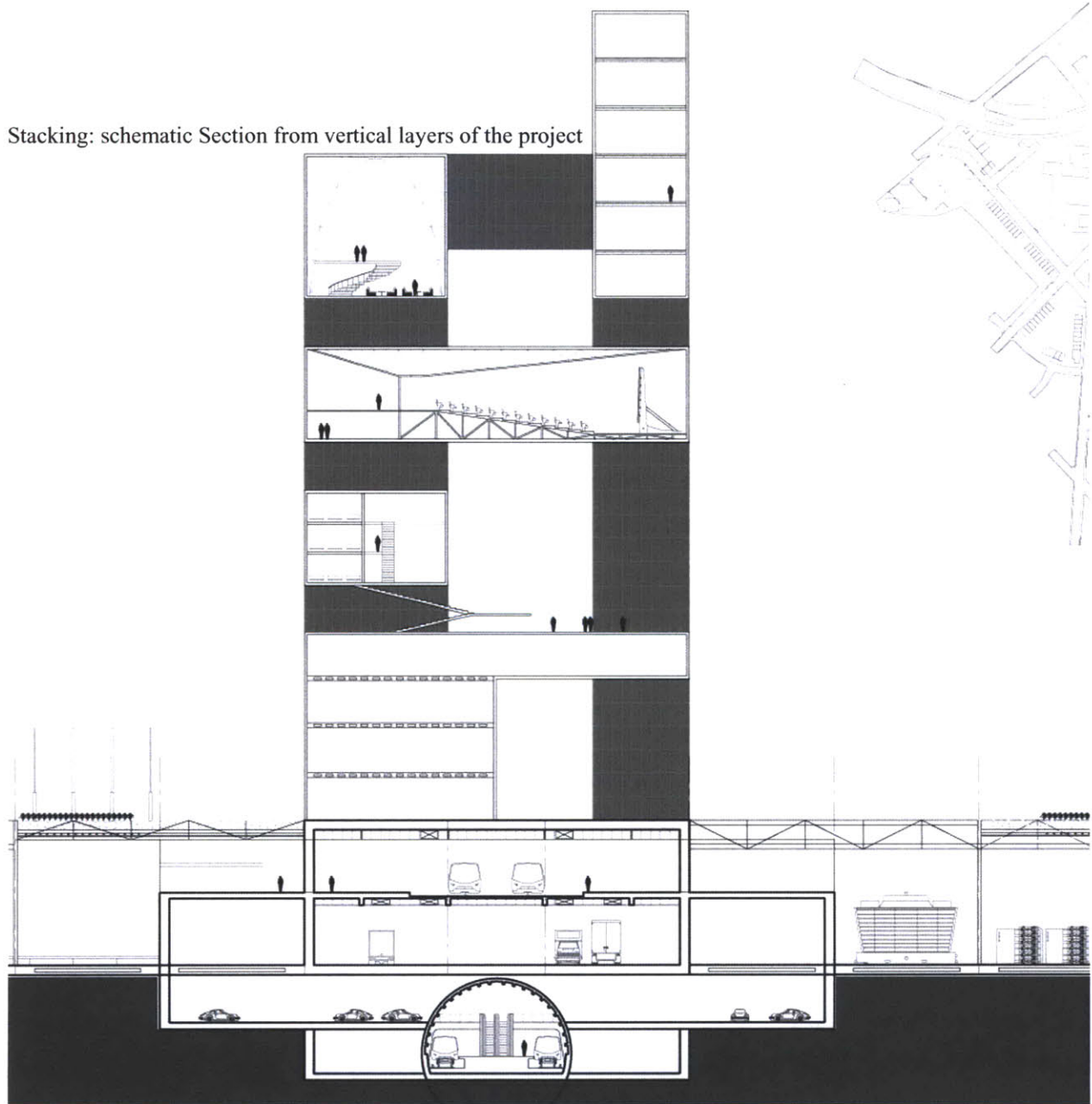


The advantage of incorporating light industries is that they create a significant amount of waste heat and waste water which can be used for other purposes. Each mega box has a separate mechanical facility consisting of a water treatment system, boiler tanks, and power generator. waste heat can be directed to boiler rooms to be used in heating systems without the need to change to another form of energy, which makes the process less costly. Waste water can also be treated to a level appropriate to be distributed in the irrigation system of agricultural production on industrial roof. The power generated by the wind turbines can be used for the electric transit system, as well as other functions.

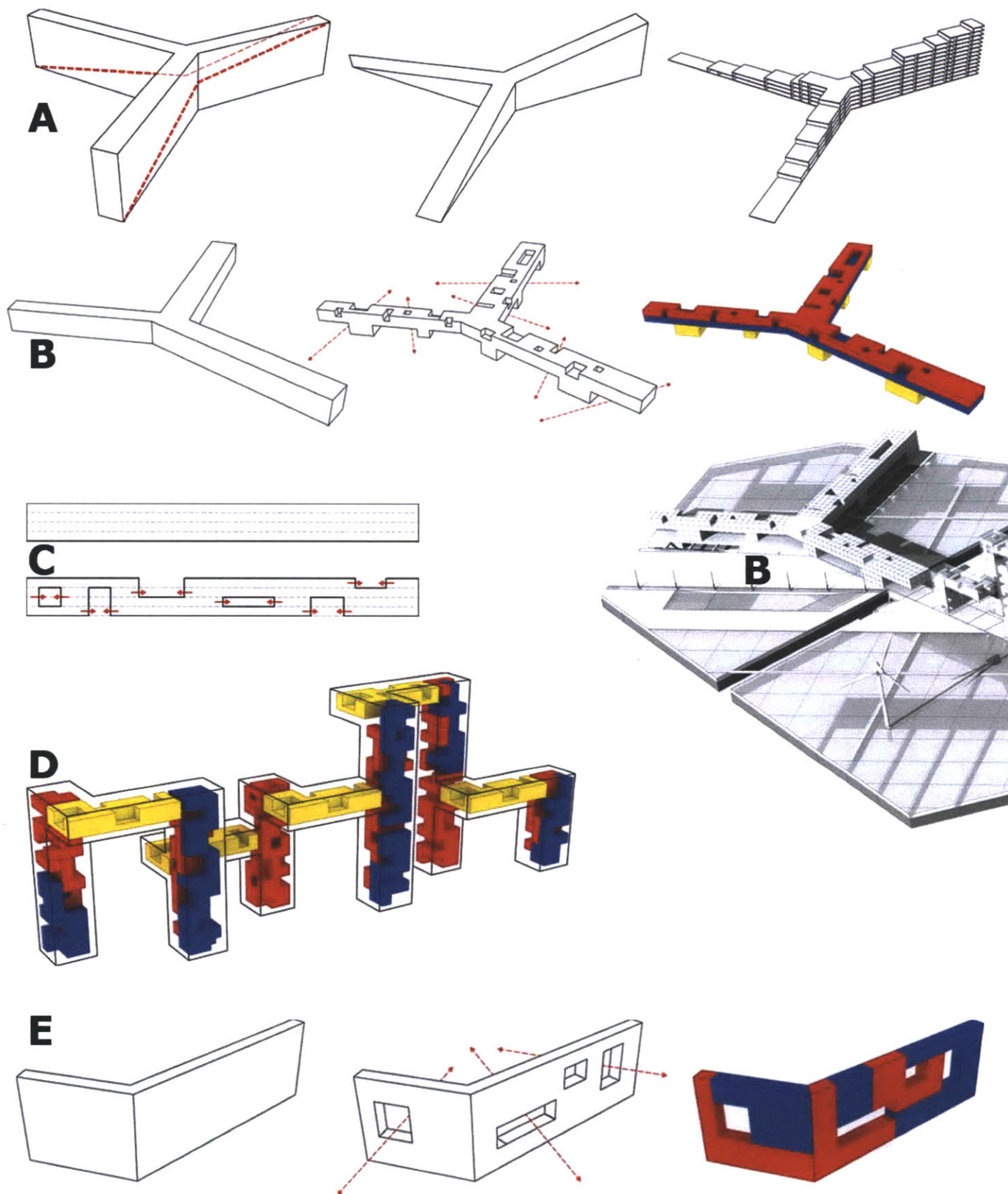


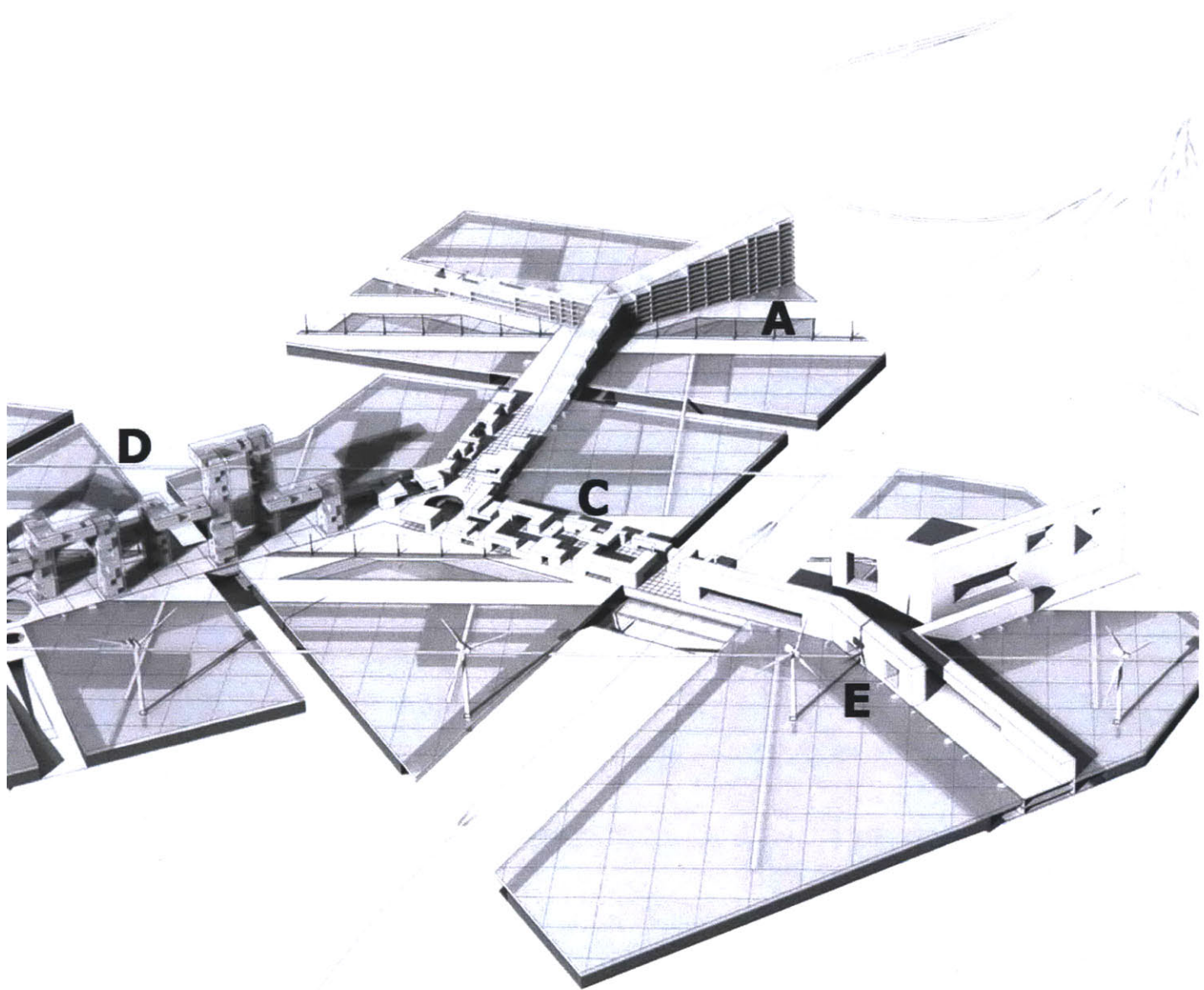
expandable geometry: the inclusion of all necessary mechanical facilities within each mega box makes it independent from the others and facilitates expansions or contractions in the future.

Stacking: schematic Section from vertical layers of the project





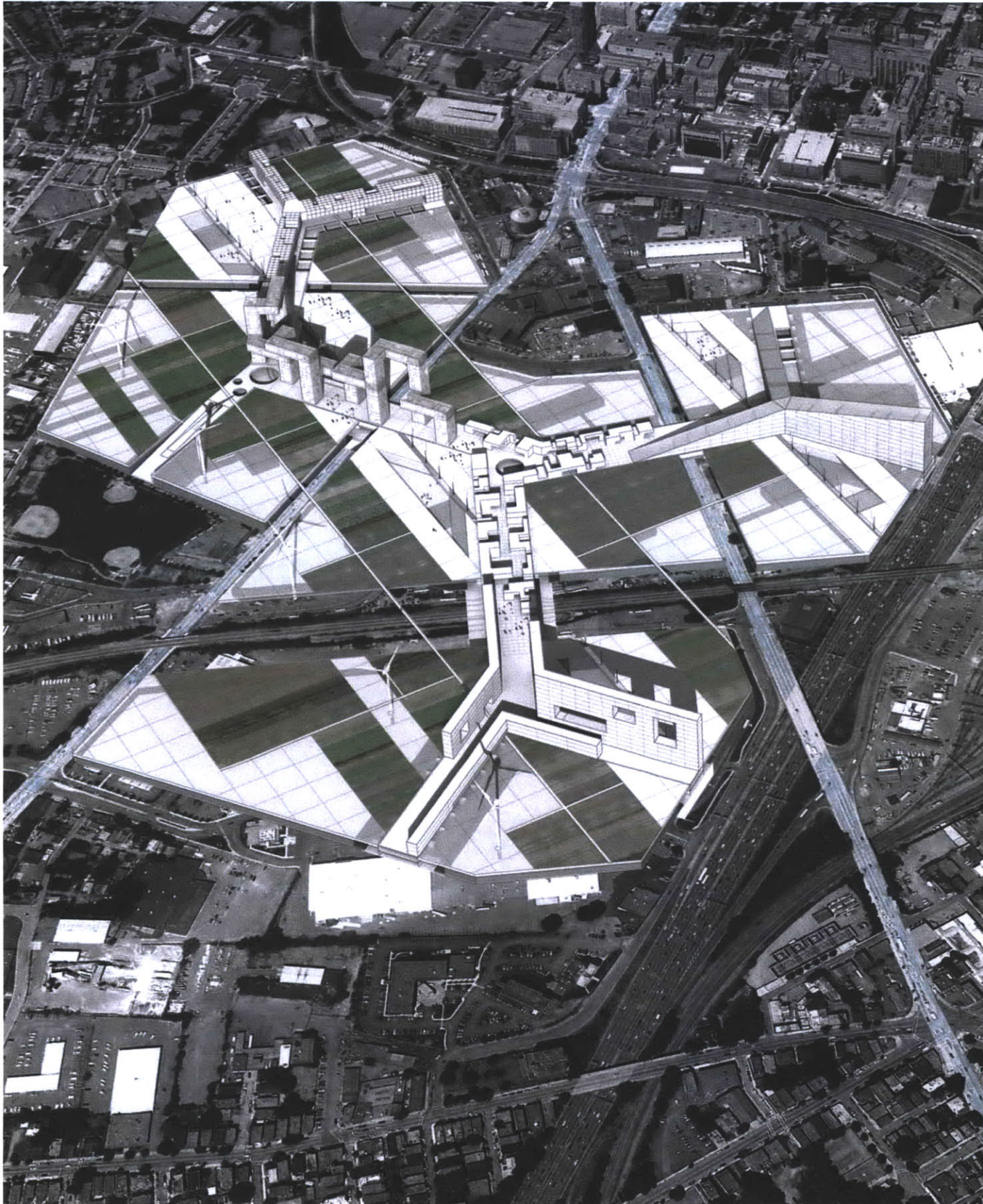




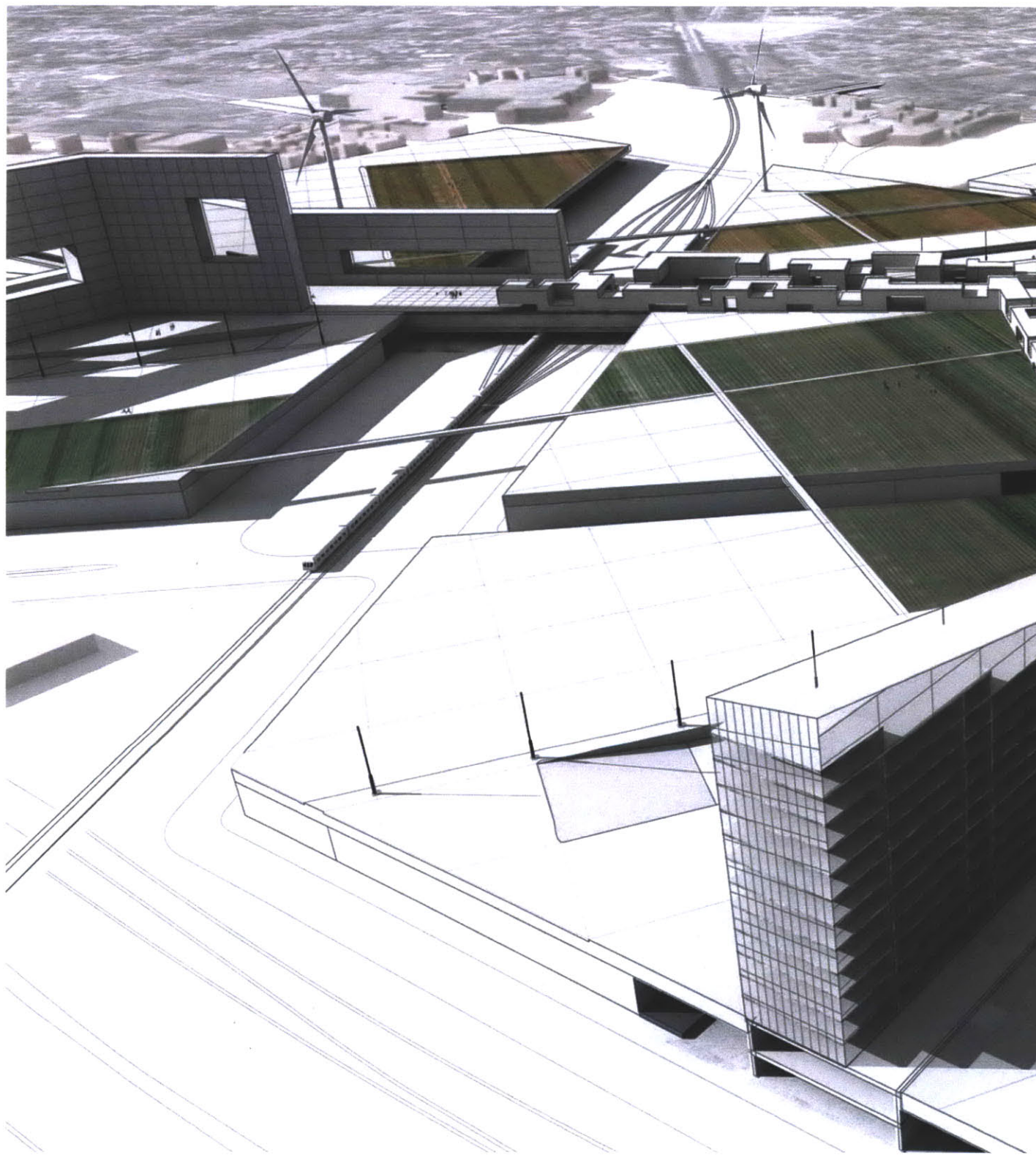
The stem structure is a platform for diverse projections. Various geometries can be adapted and used in this structure to create combinations of super structures and mixed-use programs as different neighborhoods of a city. Correspondant to the direction of the sun, spaces with direct light can become residential (blue), while those with indirect light can be used for office or commercial purpose (red). Shared spaces can incorporate public and common facilities.

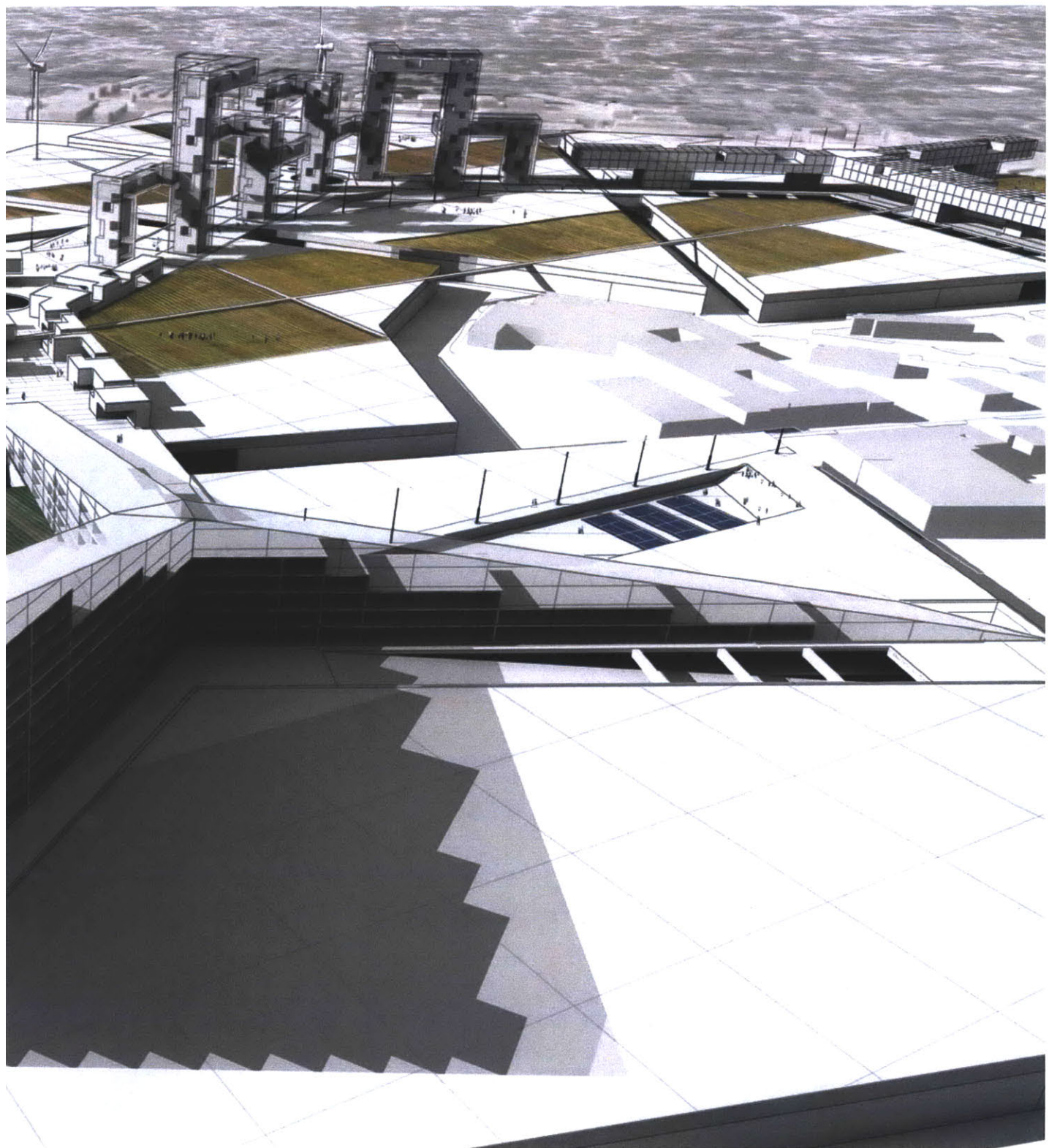


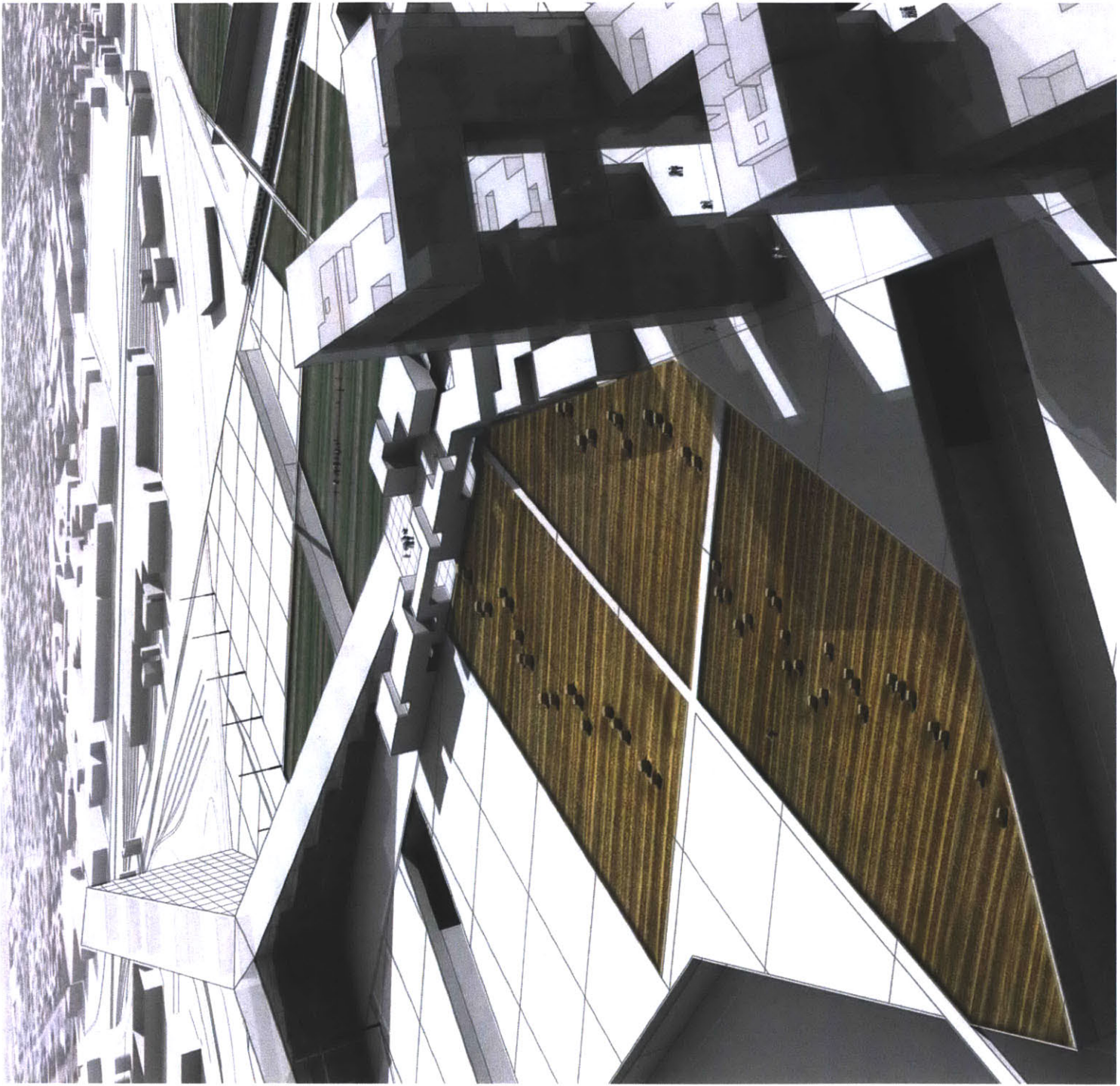


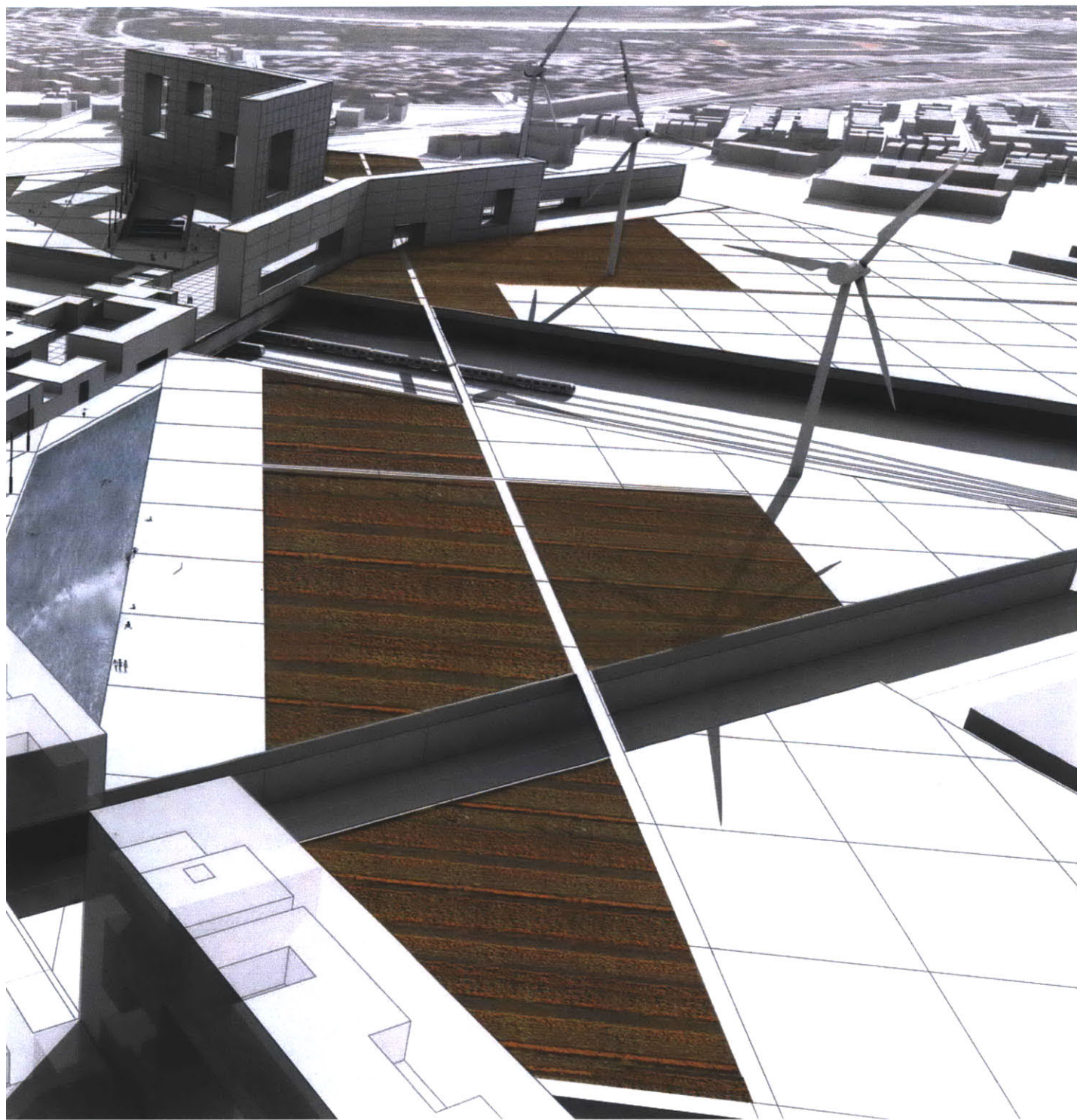


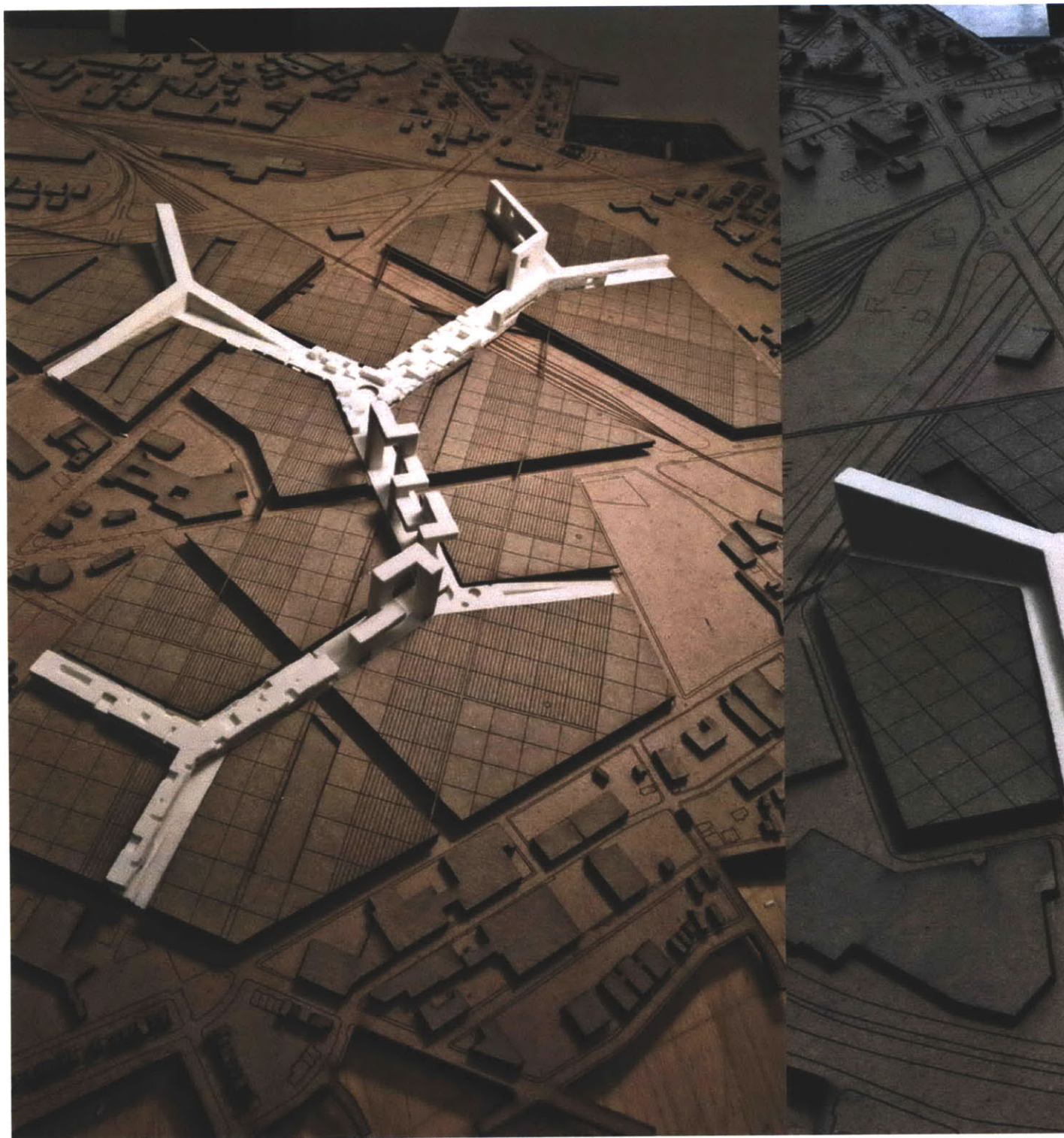


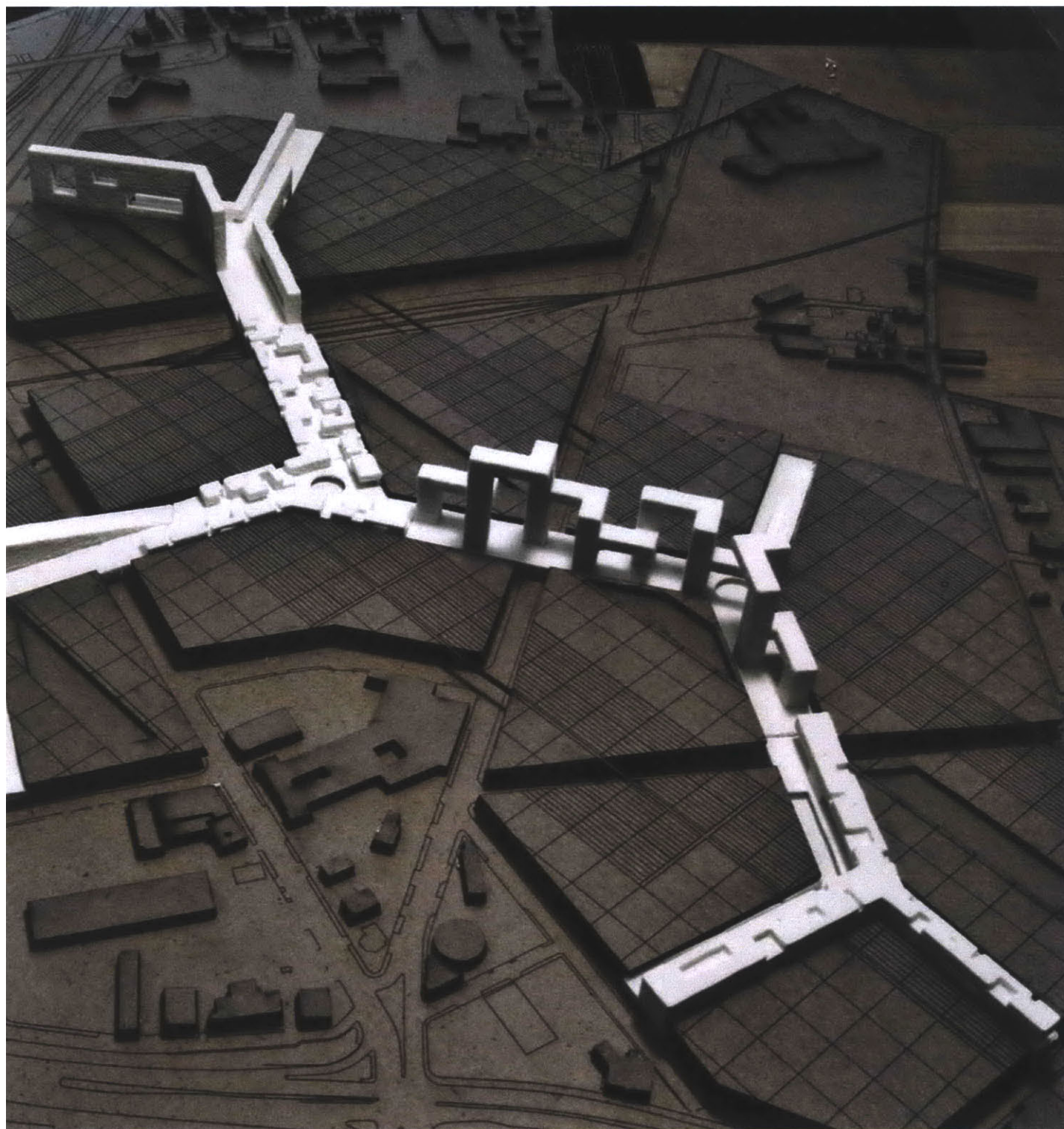












Conclusion:

Although noticable in proportion and impact on American cities, urban industrial landscapes have been neglected and considered as archipelagos of dead lands in the middle of the city. However, they acquire potentials and unique features, which if explored and cultivated, can be incorporated in conceiving provocative projects addressing emergent urban issues. These new urbanisms can become generators of advanced hybrid typologies of hman habitation, energy production, and urban agriculture as the new form of living in the 21st century.

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